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Maddur et al.

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(54) **TISSUE GUIDE FOR CURVED END EFFECTORS**

(58) **Field of Classification Search**
CPC ... A61B 17/072; A61B 17/105; A61B 17/115;
A61B 17/1157; A61B 2017/07221;
(Continued)

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(73) Assignee: **Covidien LP**, Mansfield, MA (US)

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(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 97 days.

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(21) Appl. No.: **17/797,196**

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JP Appln. No. 2022-547073, 7 pages.

(86) PCT No.: **PCT/CN2020/074175**

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Primary Examiner — Stephen F. Gerrity
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(74) *Attorney, Agent, or Firm* — Carter, DeLuca &
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(65) **Prior Publication Data**

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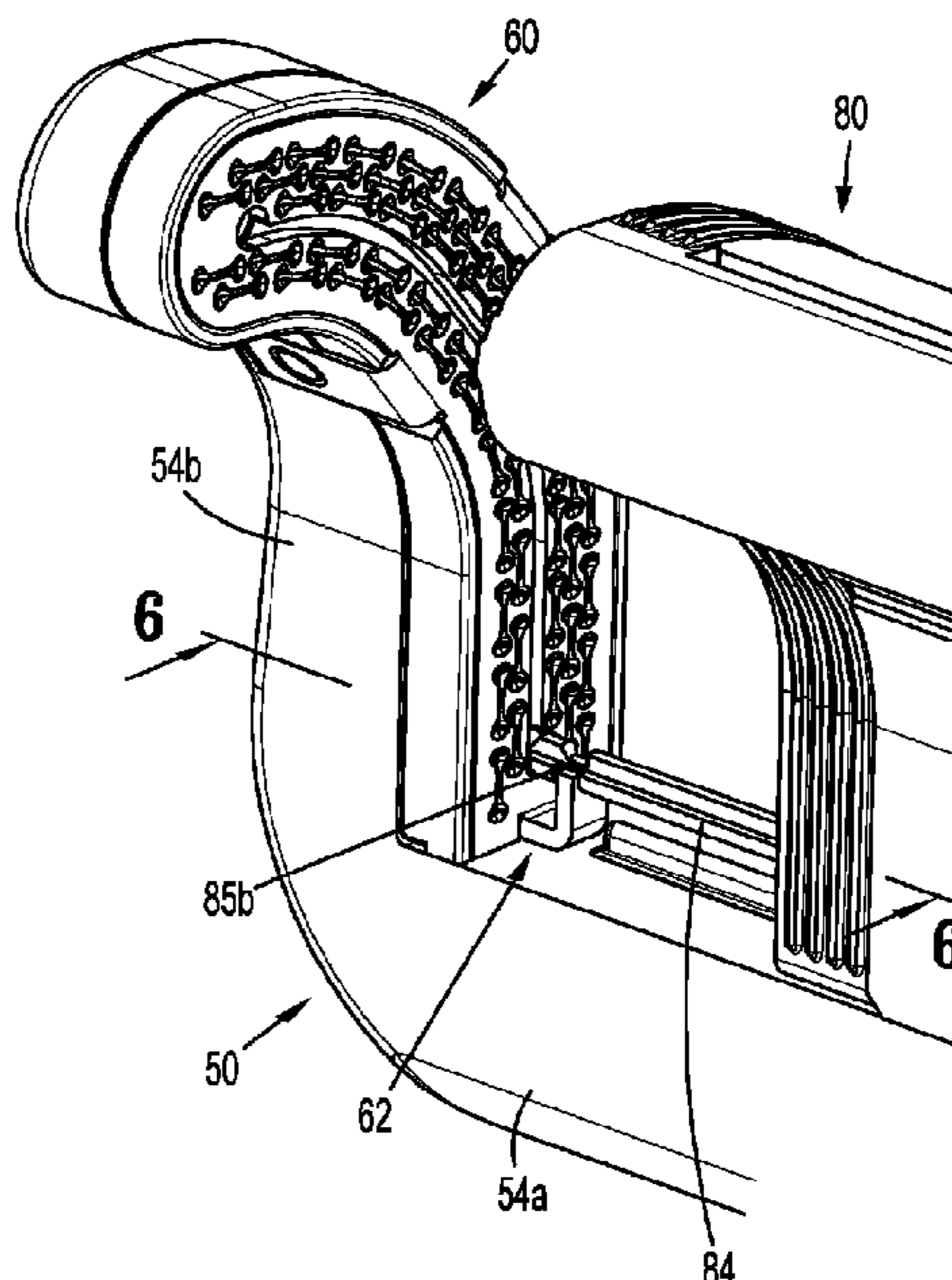
(57) **ABSTRACT**

(51) **Int. Cl.**
A61B 17/072 (2006.01)

(52) **U.S. Cl.**
CPC .. **A61B 17/072** (2013.01); **A61B 2017/07221**
(2013.01); **A61B 2017/07257** (2013.01)

A surgical stapling instrument includes an elongate body portion defining a longitudinal axis, and an end effector supported on a distal portion of the elongated body portion. The end effector includes a housing having a base portion and a jaw portion, an anvil assembly supported on the jaw portion, and a cartridge assembly releasably supported on the base portion. A tissue guide member is operably secured relative to the cartridge assembly to facilitate alignment of the cartridge assembly through a firing stroke.

14 Claims, 21 Drawing Sheets



(58) **Field of Classification Search**
 CPC A61B 2017/07257; A61B 2017/07271;
 A61B 2017/07228; A61B 2017/07214
 See application file for complete search history.

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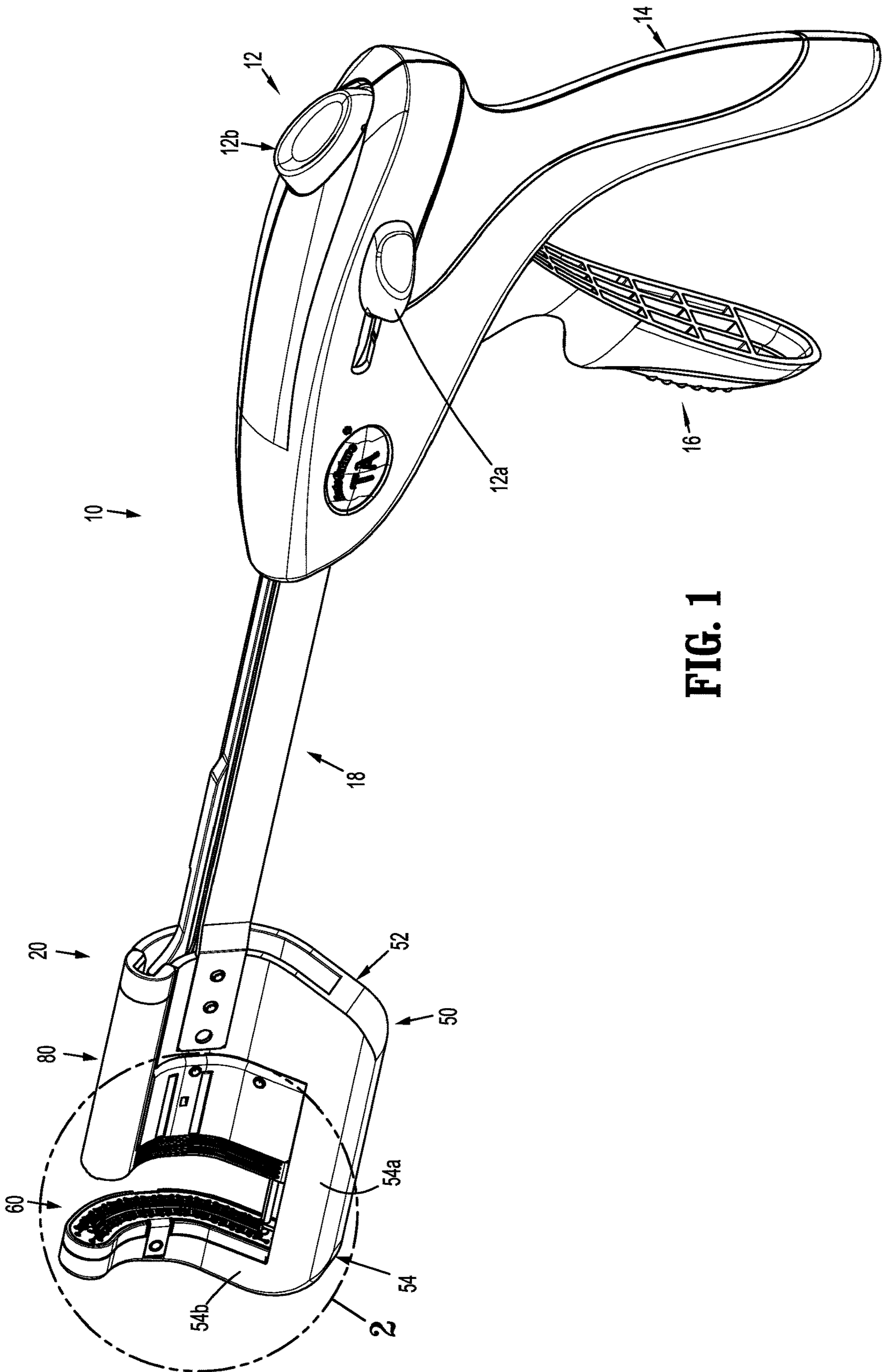


FIG. 1

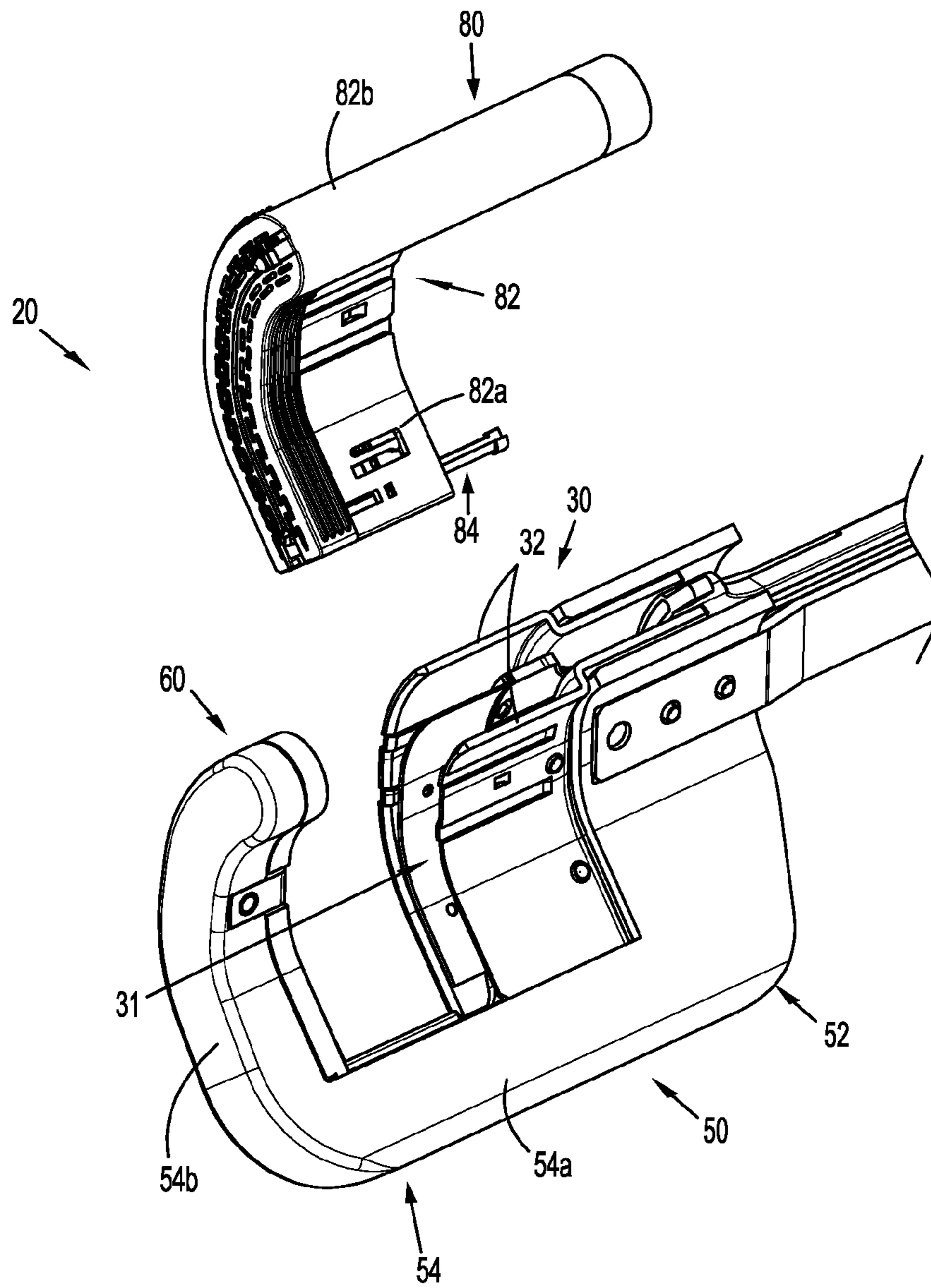


FIG. 2

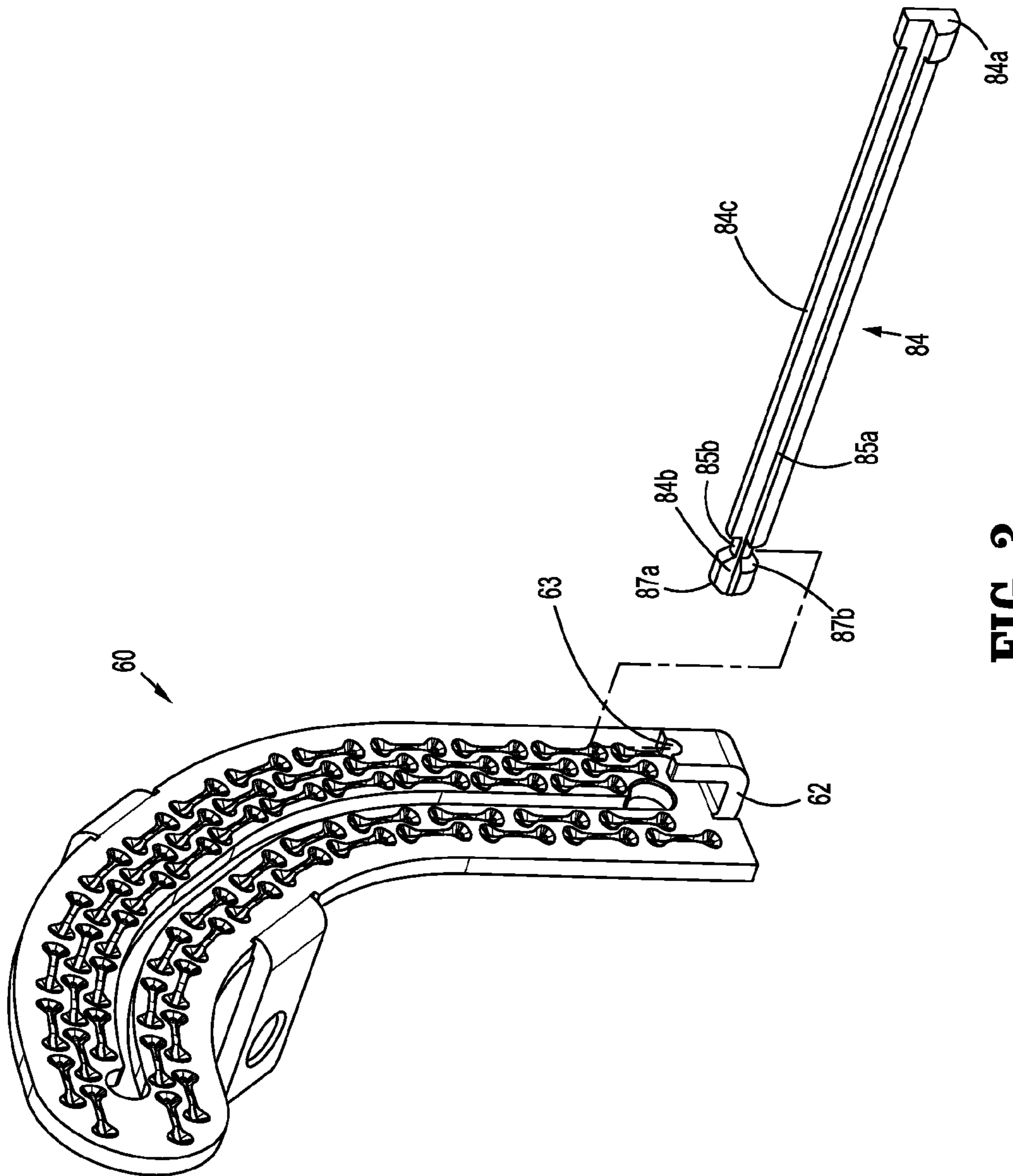


FIG. 3

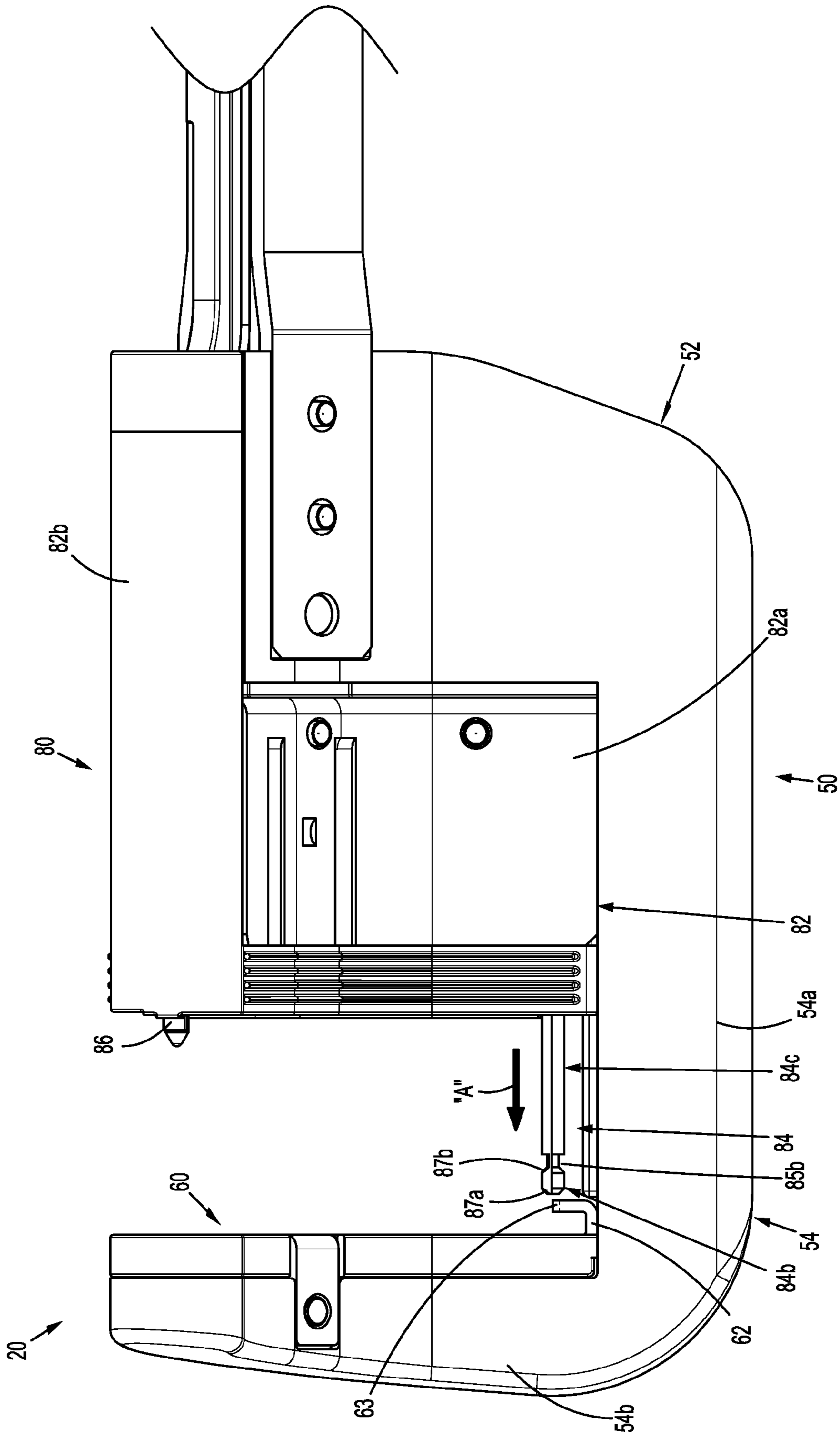


FIG. 4

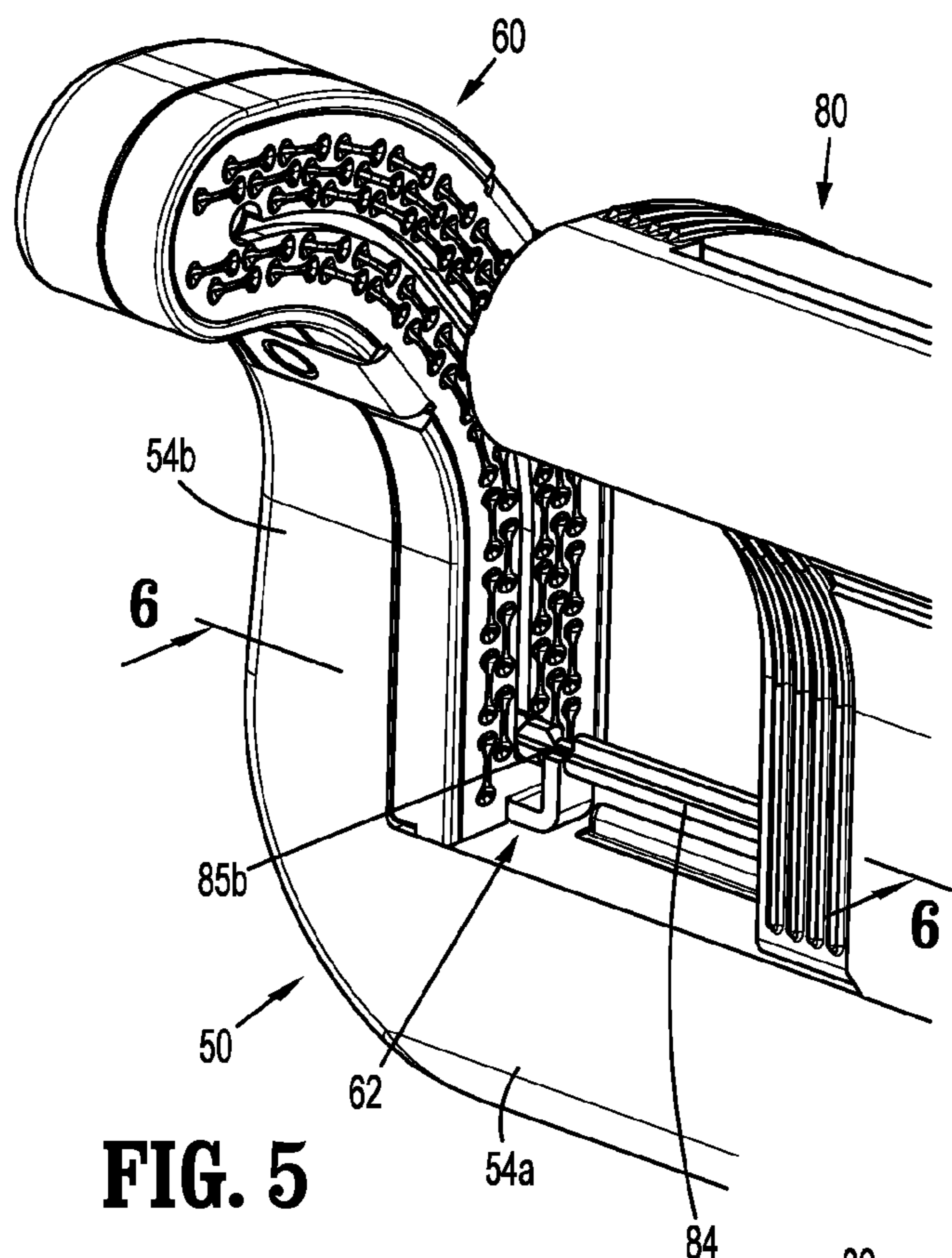


FIG. 5

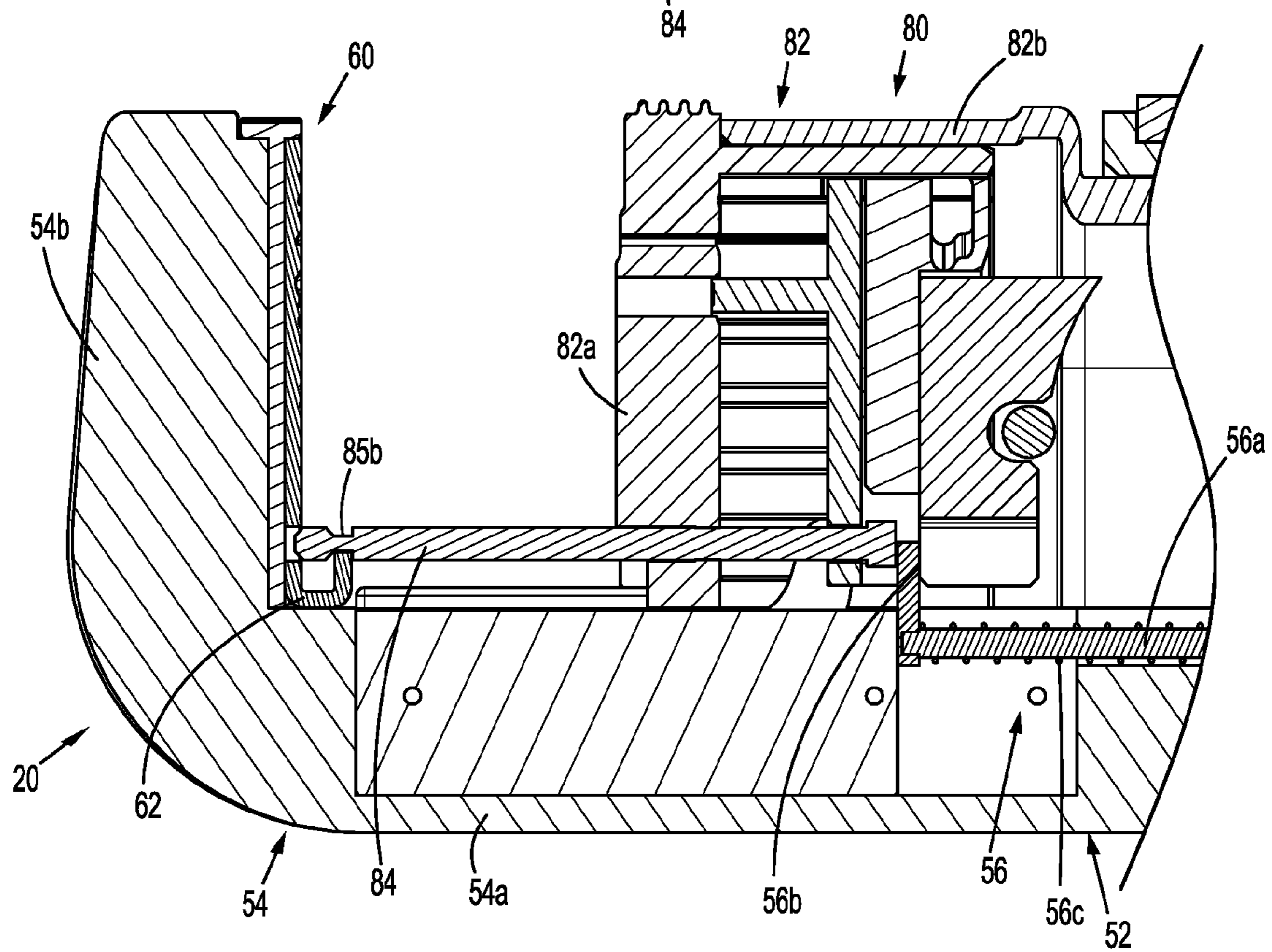


FIG. 6

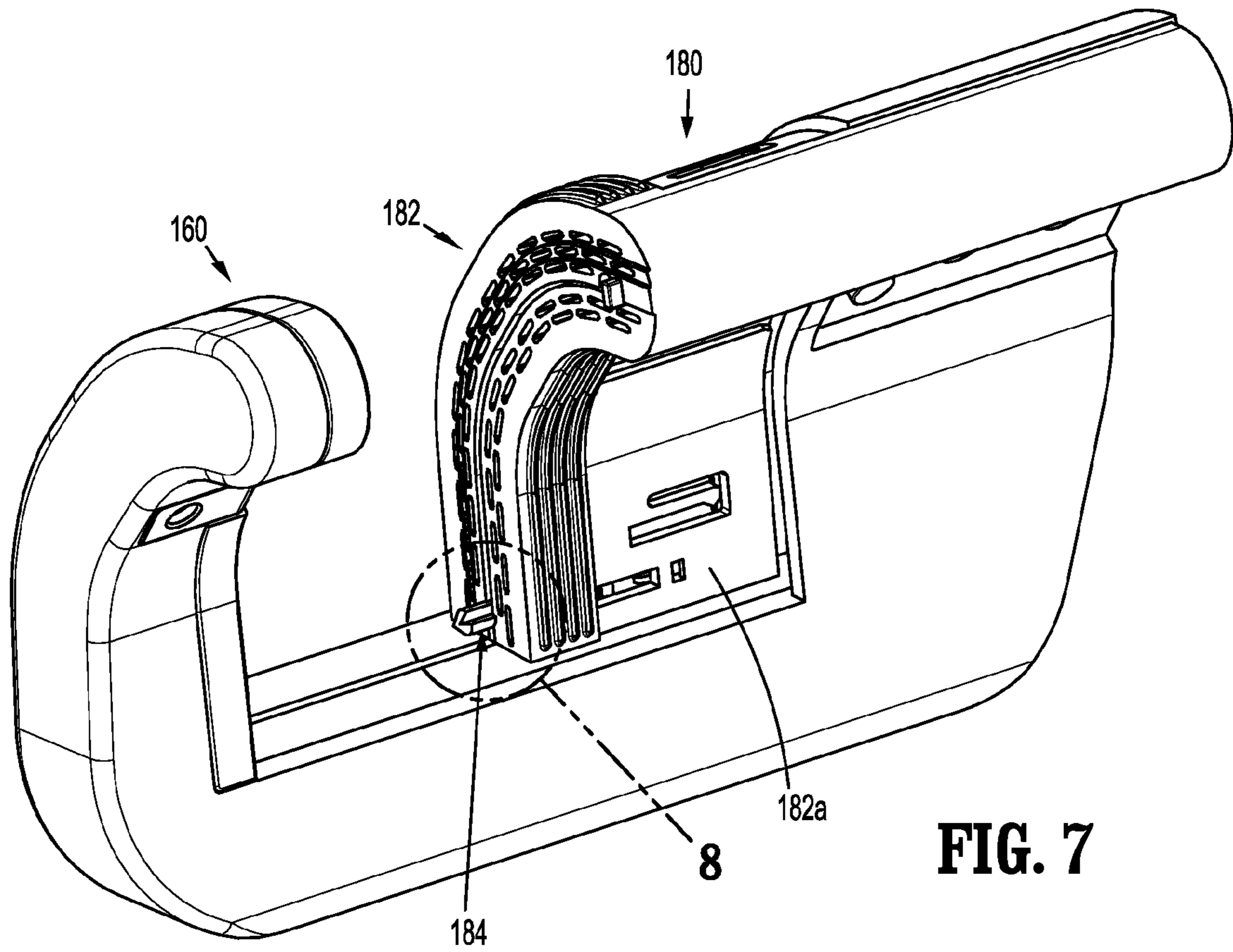


FIG. 7

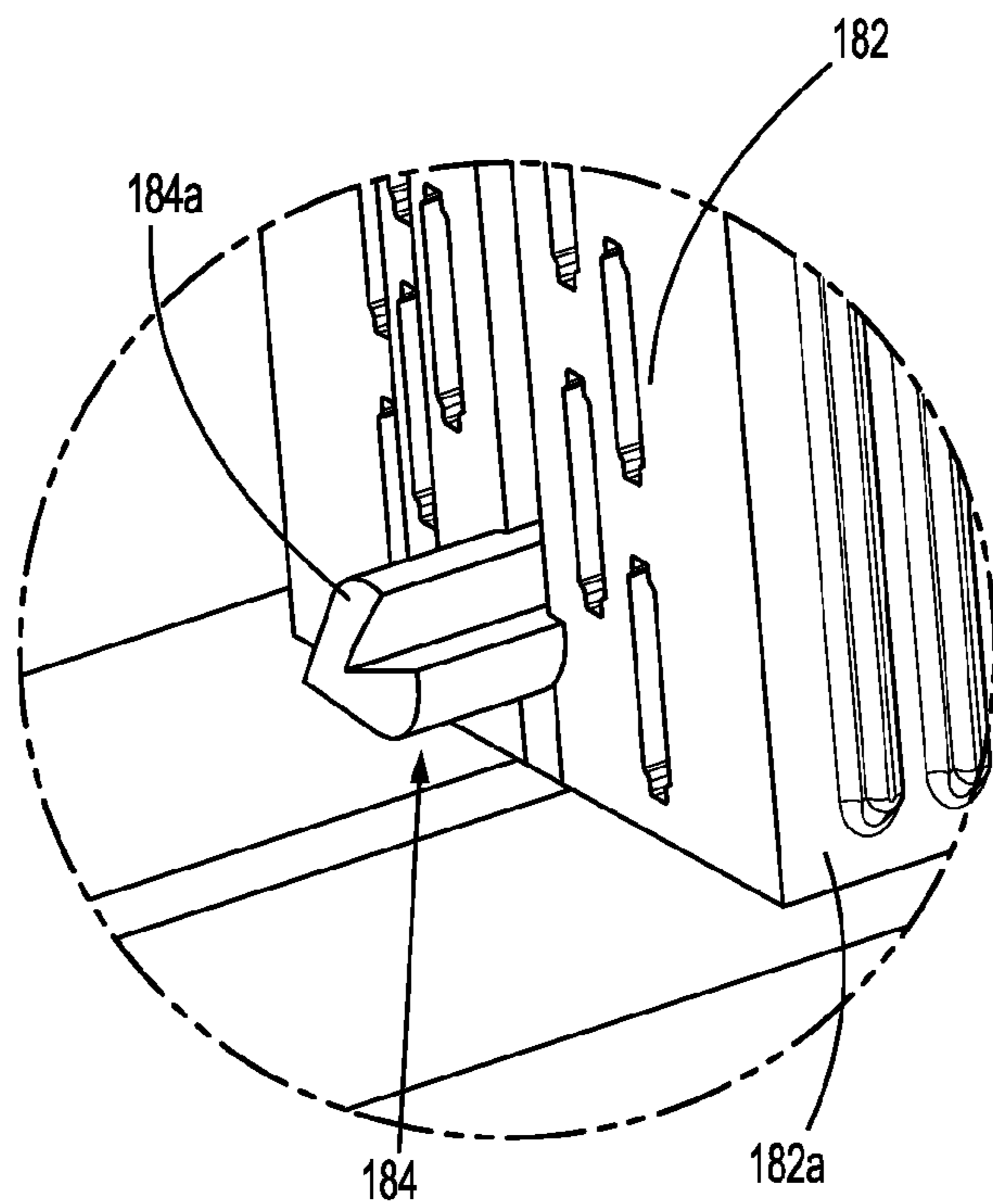


FIG. 8

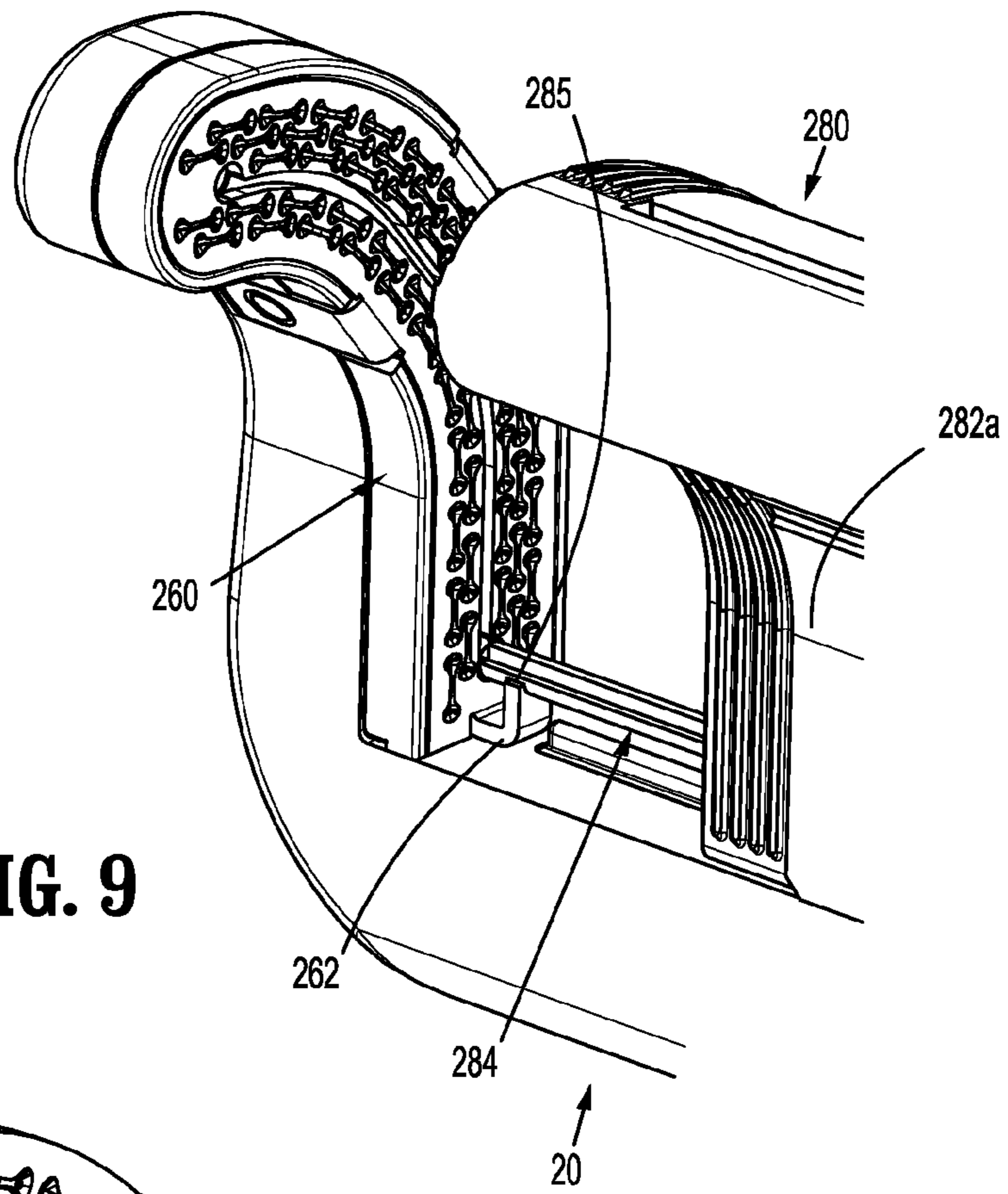


FIG. 9

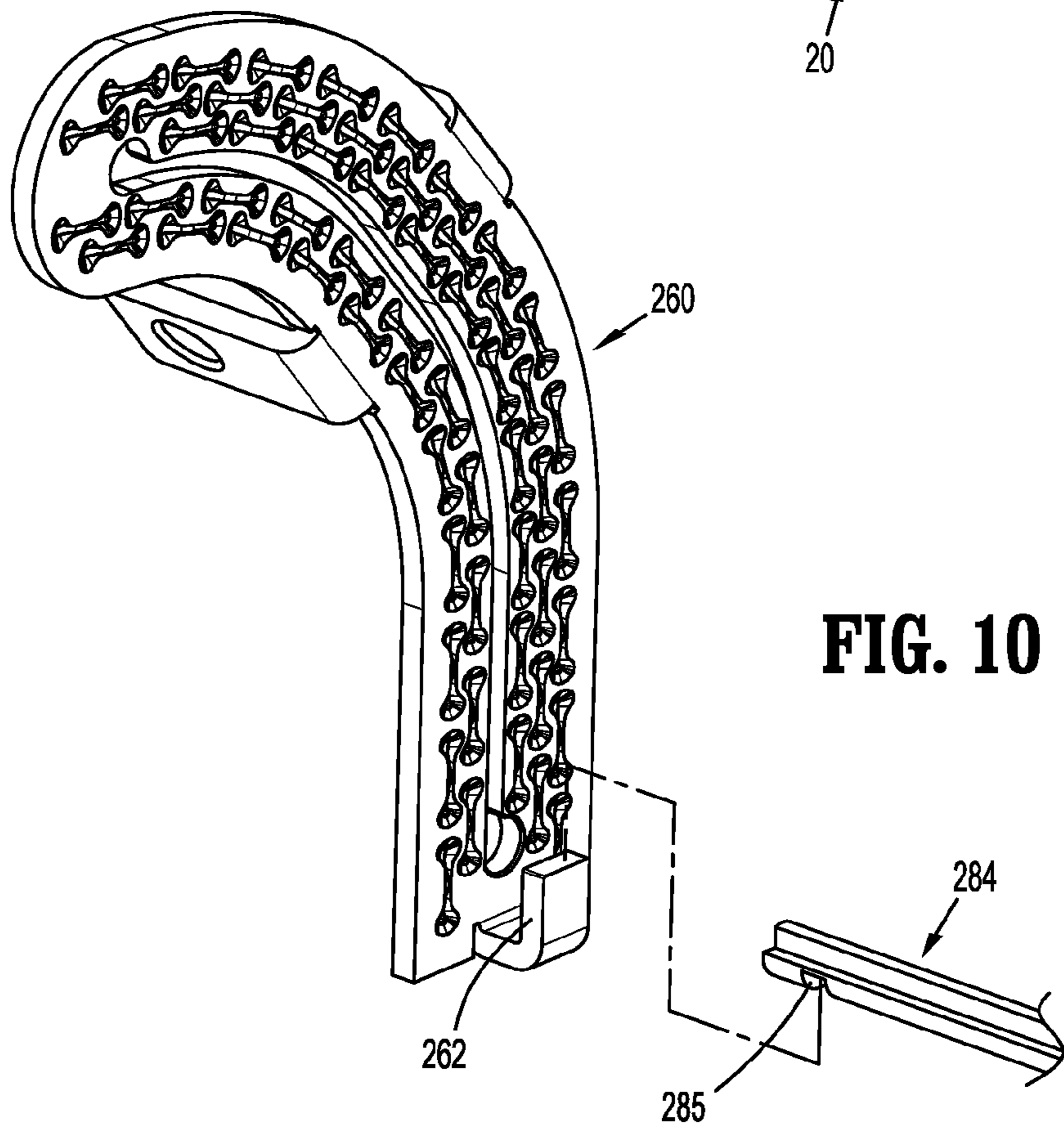


FIG. 10

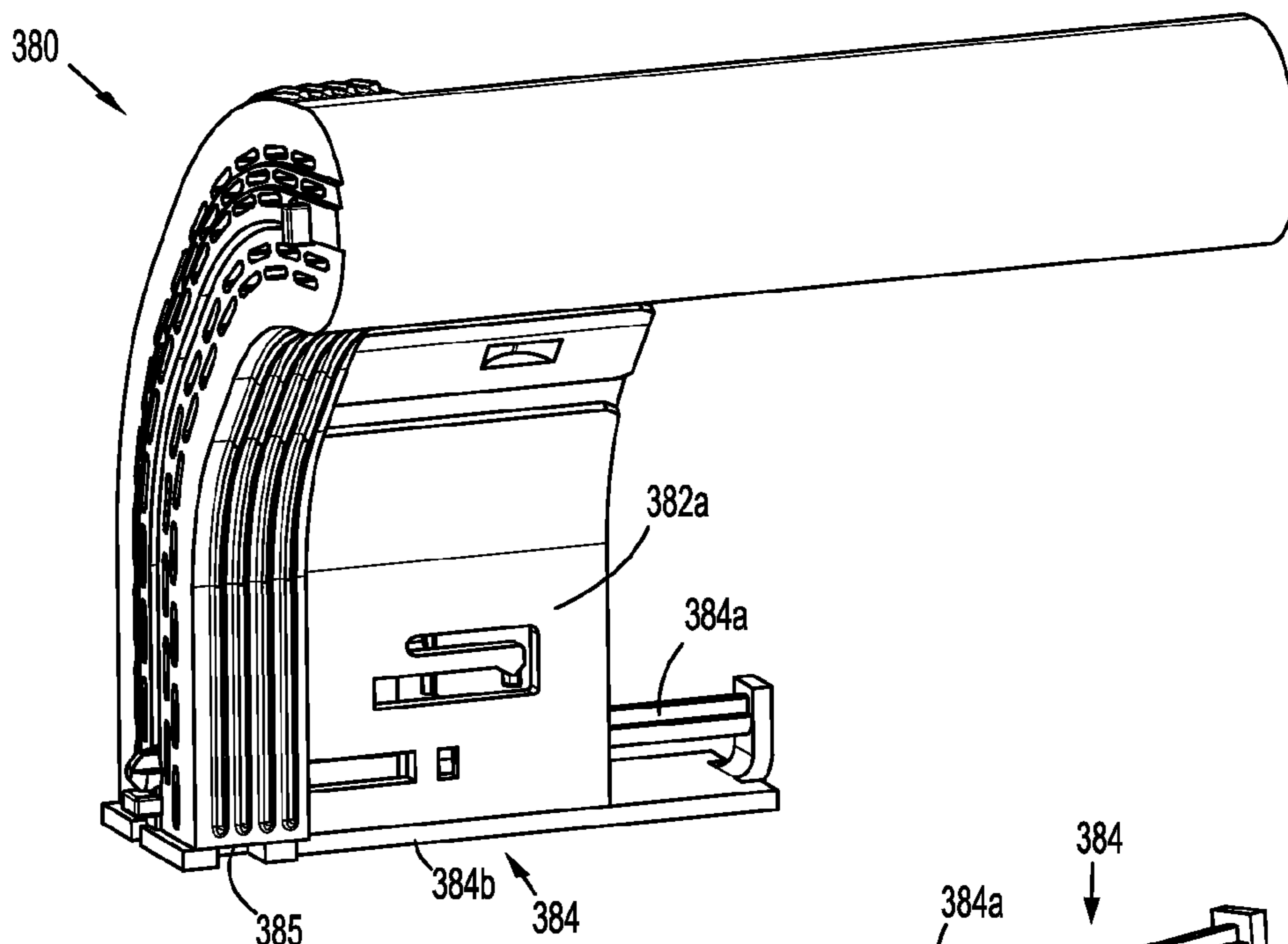


FIG. 11

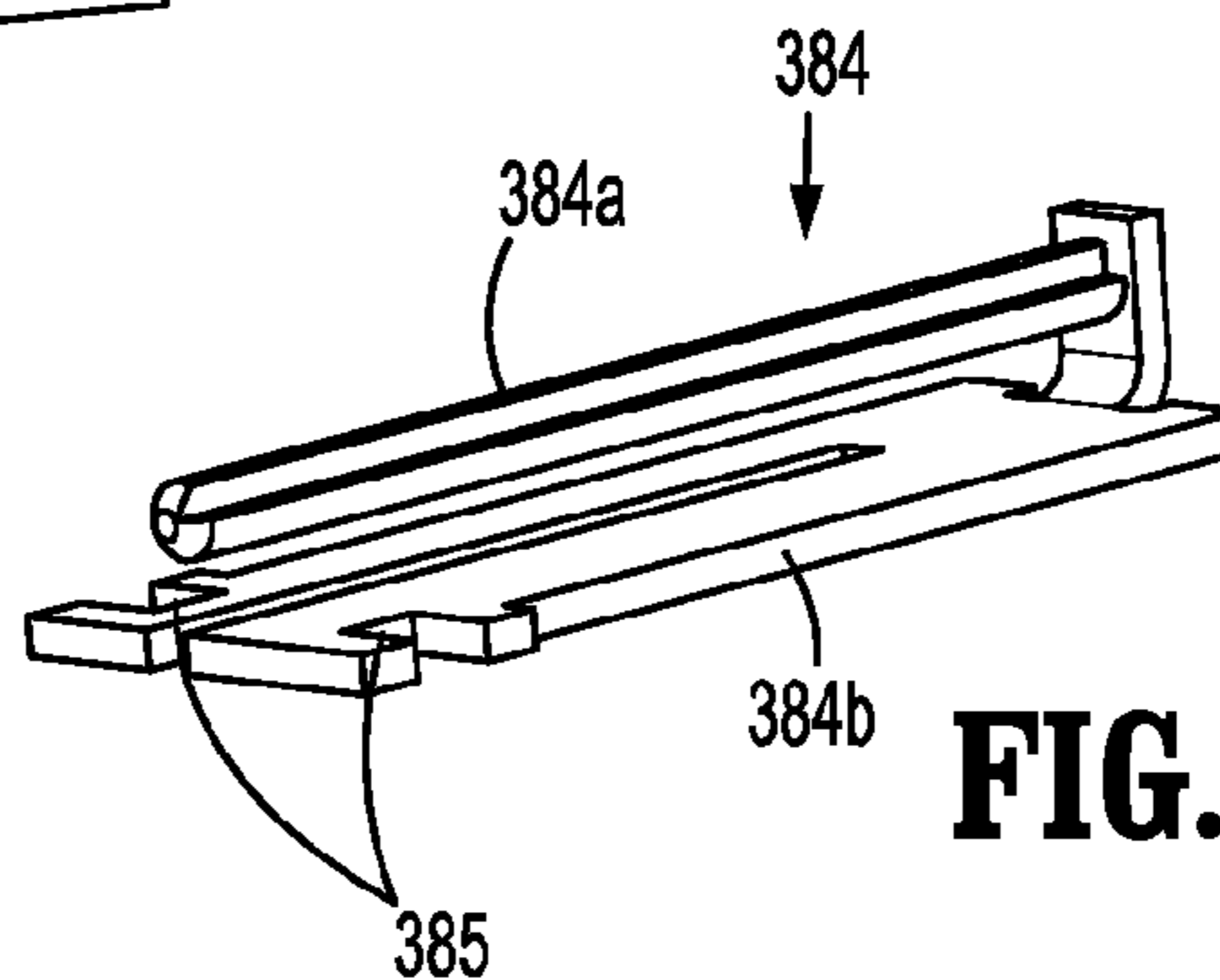


FIG. 12

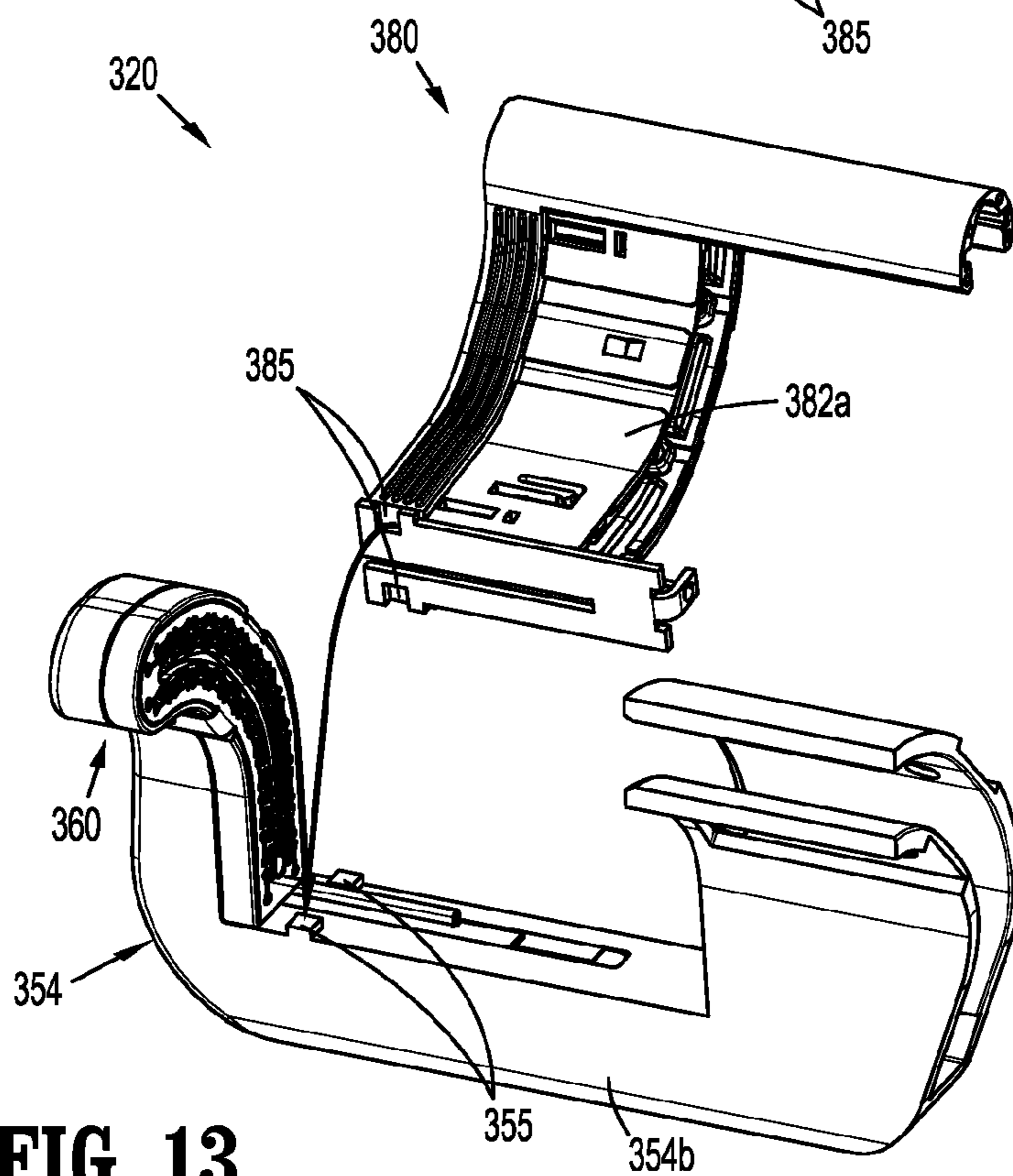


FIG. 13

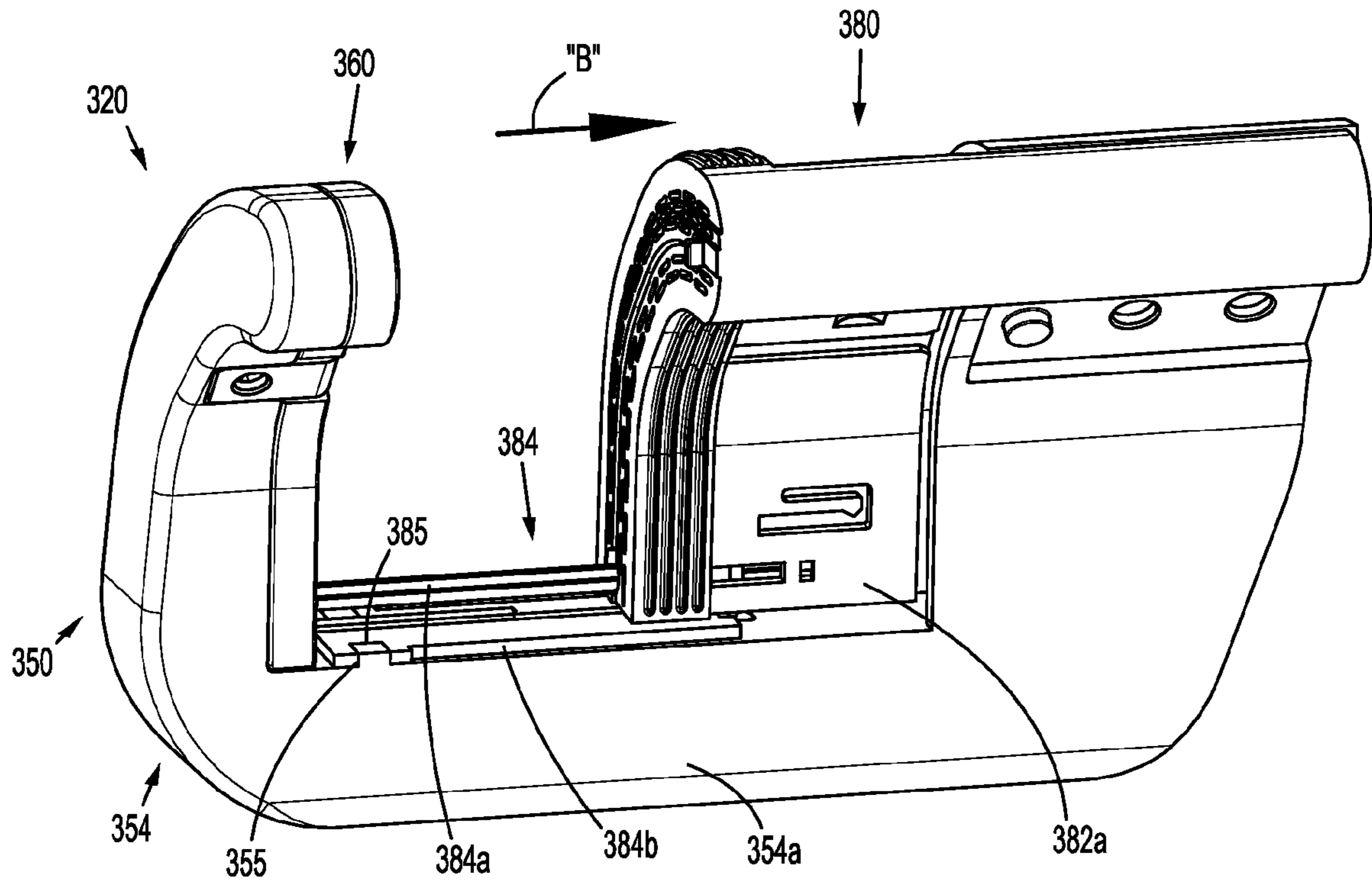


FIG. 14

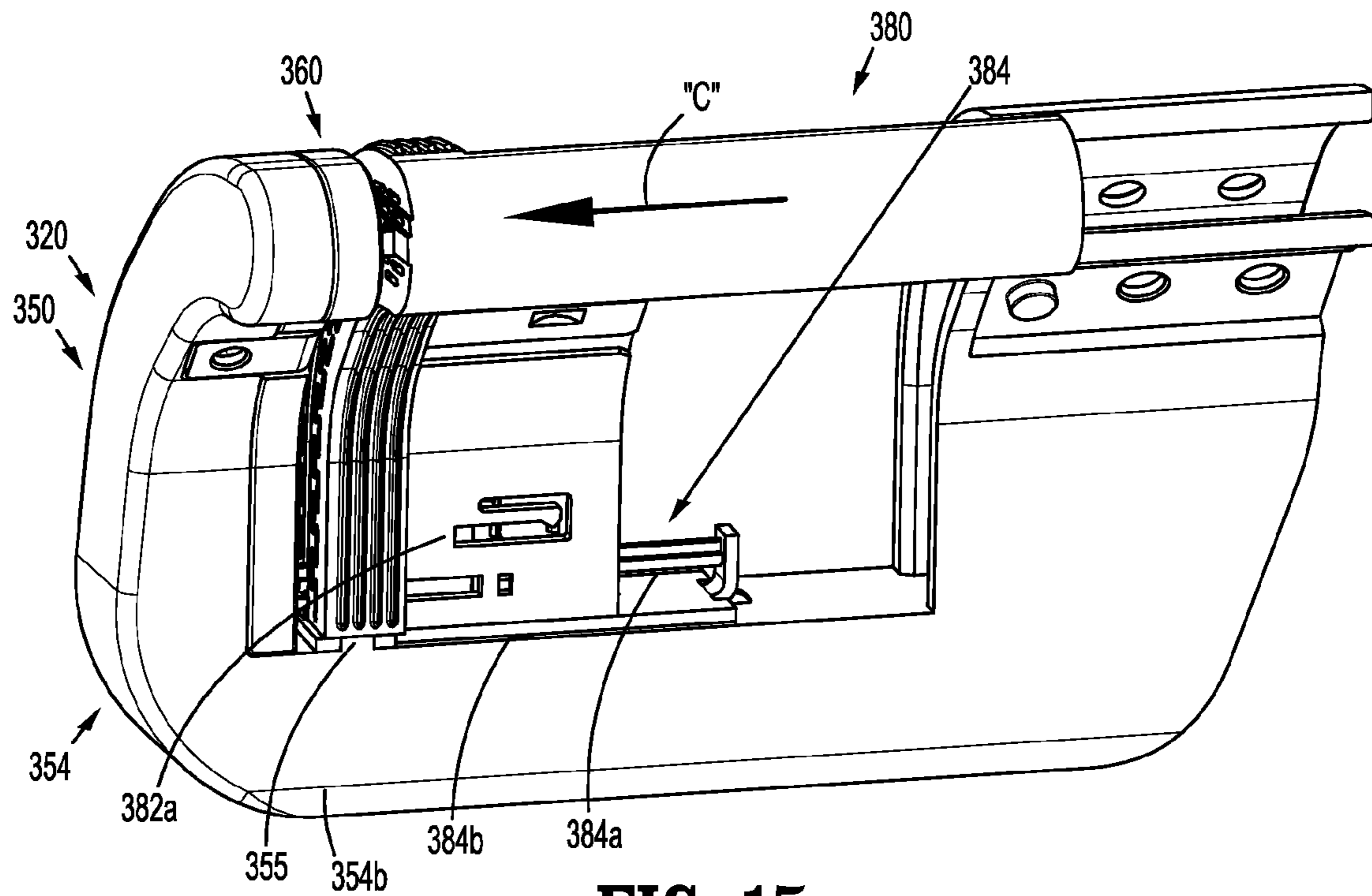


FIG. 15

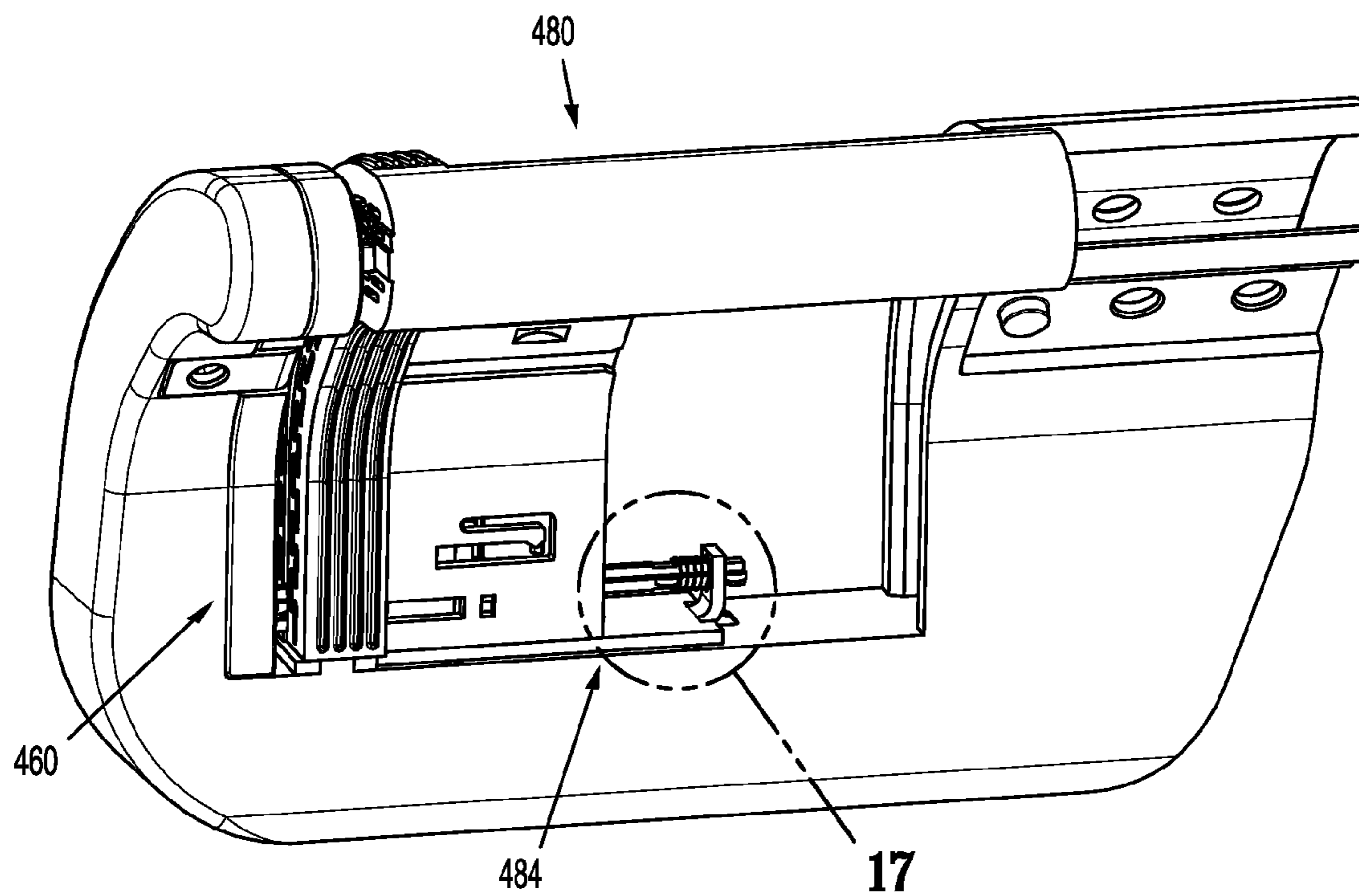


FIG. 16

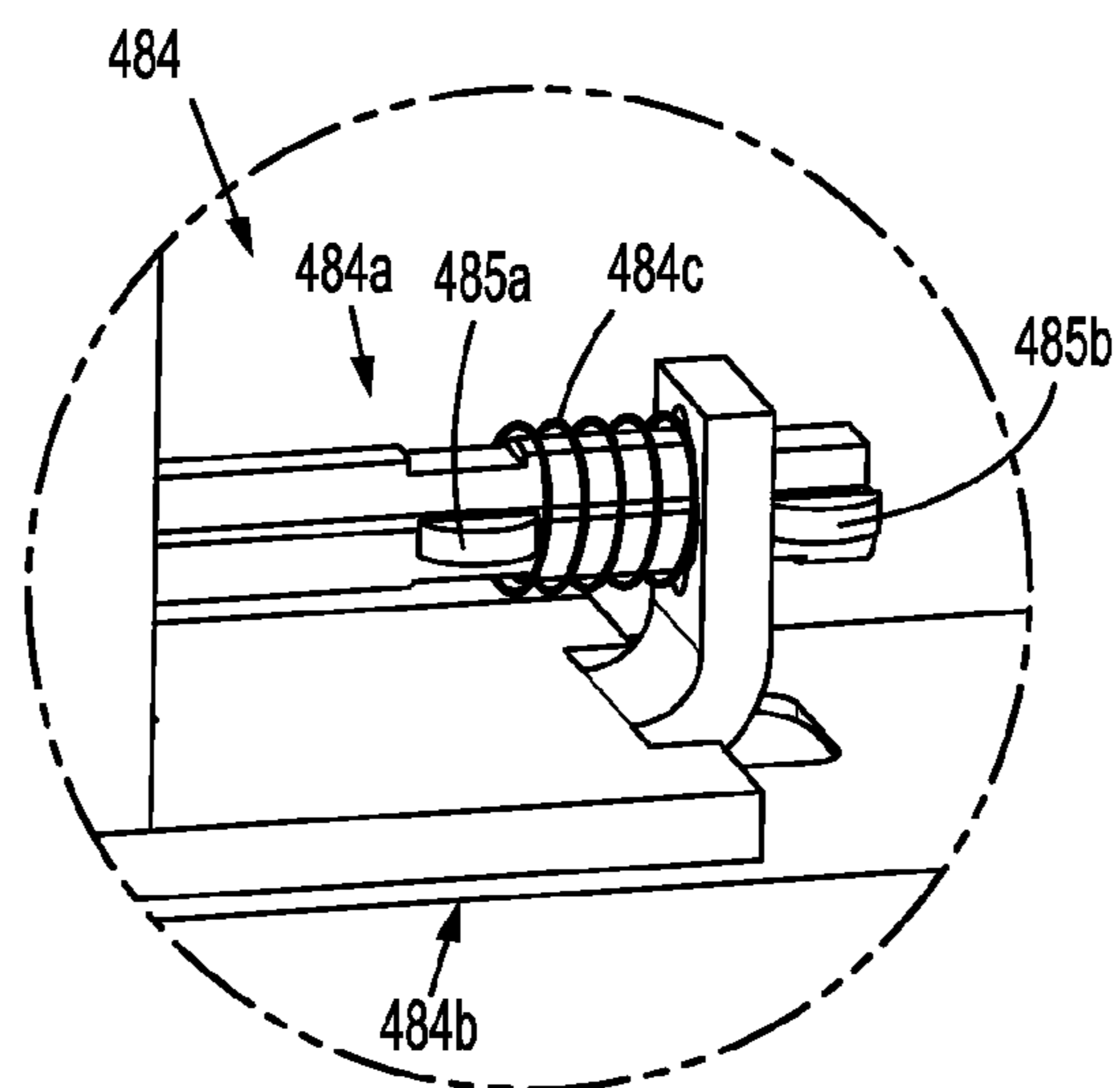


FIG. 17

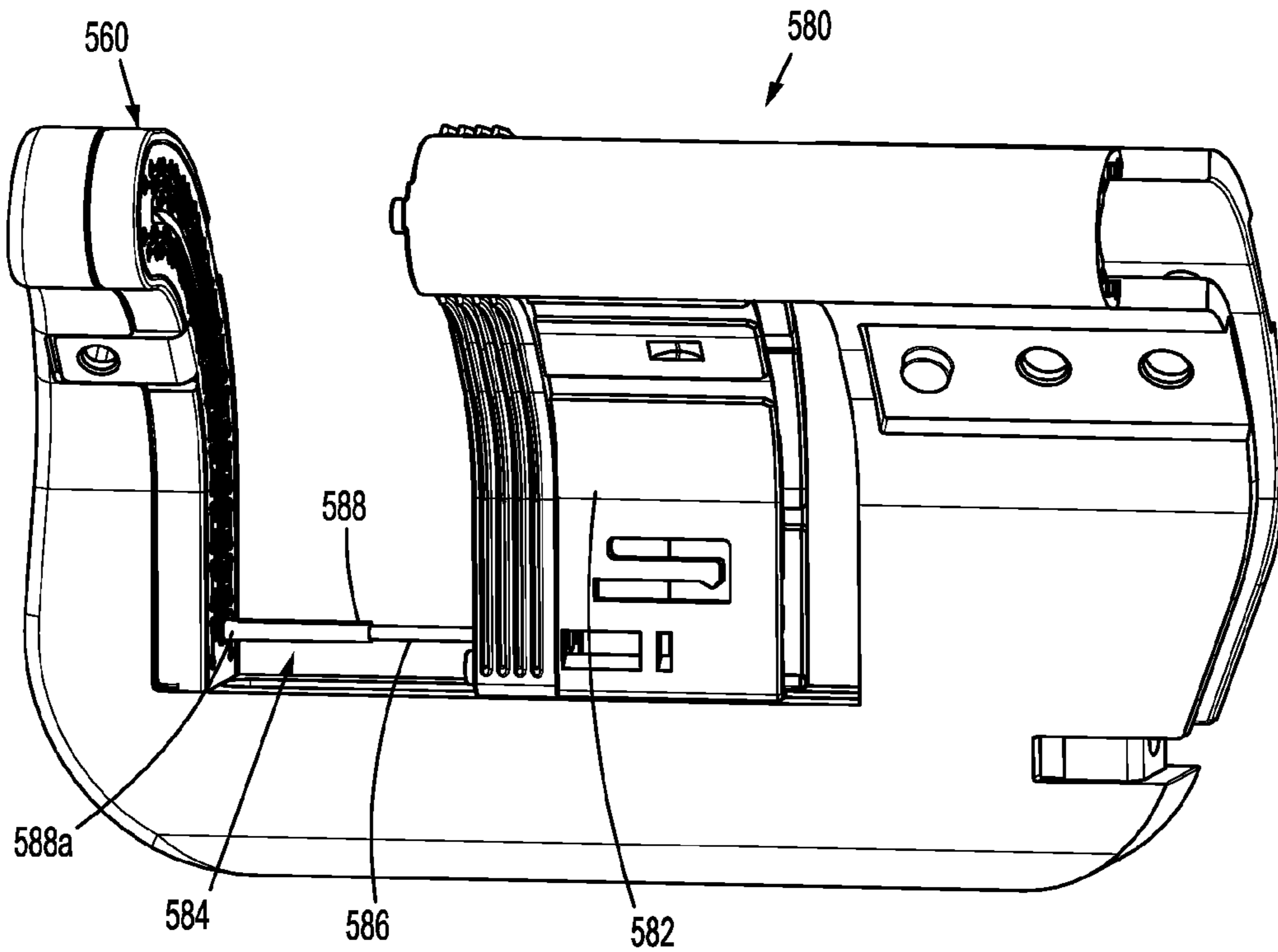


FIG. 18

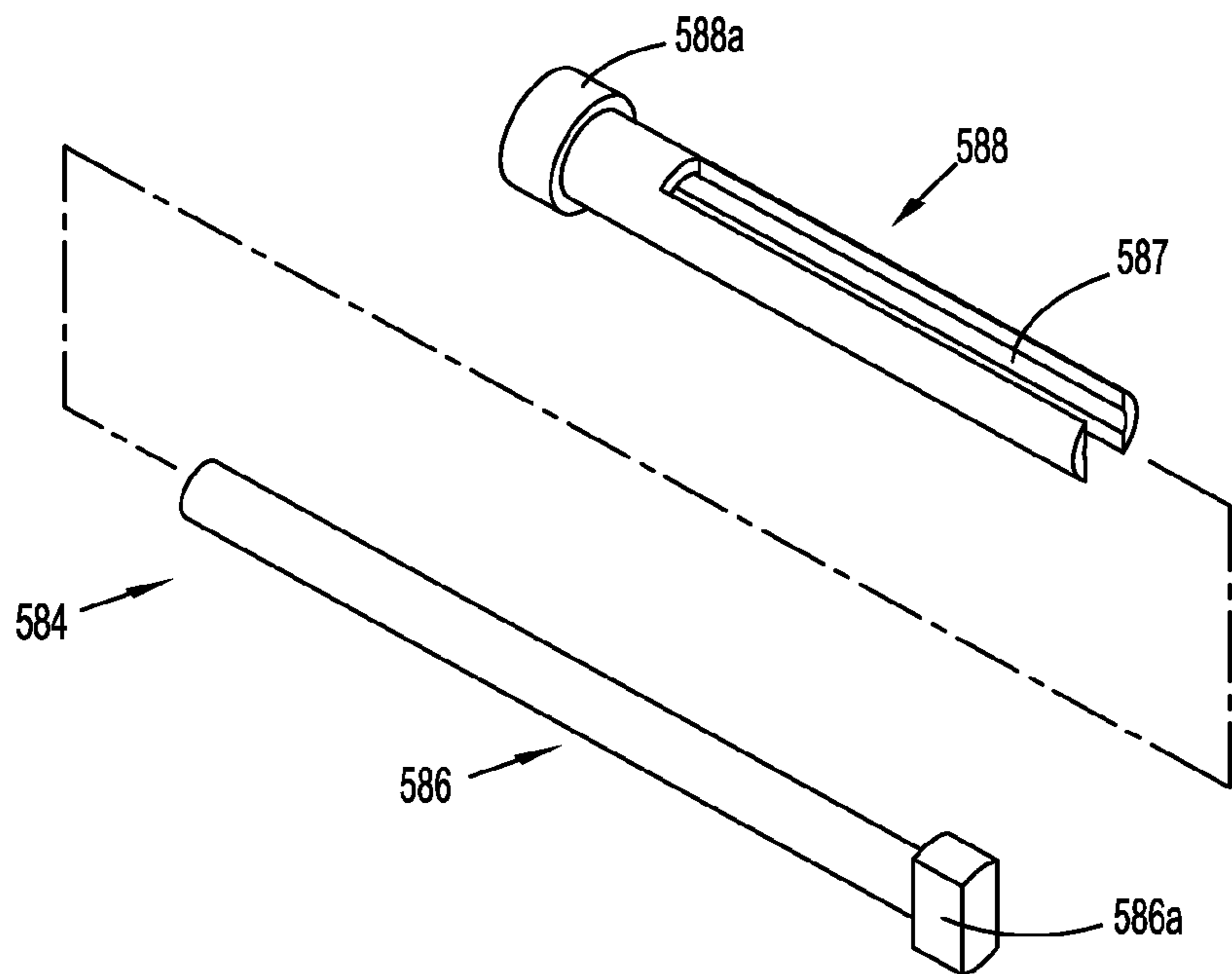


FIG. 19

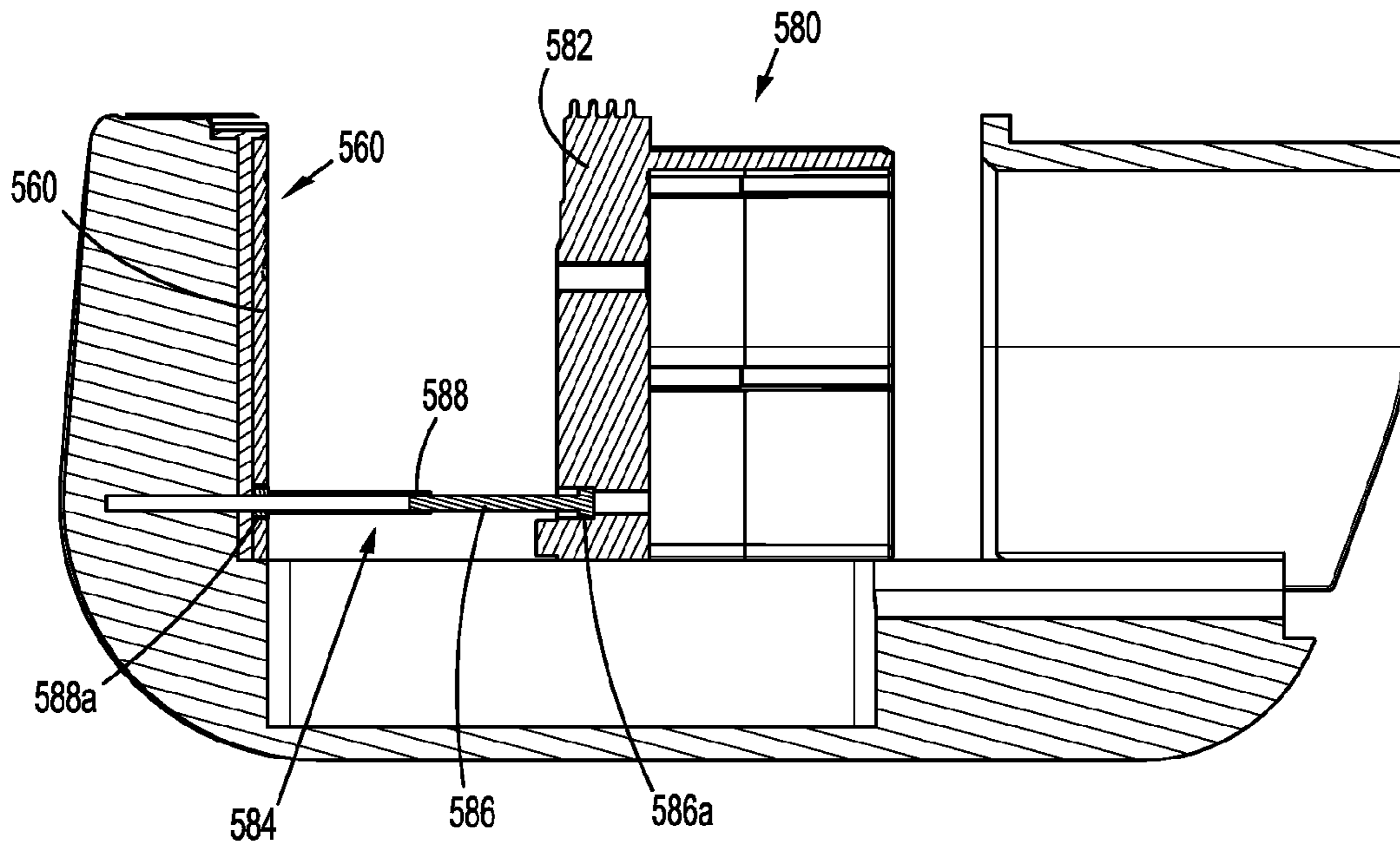


FIG. 20

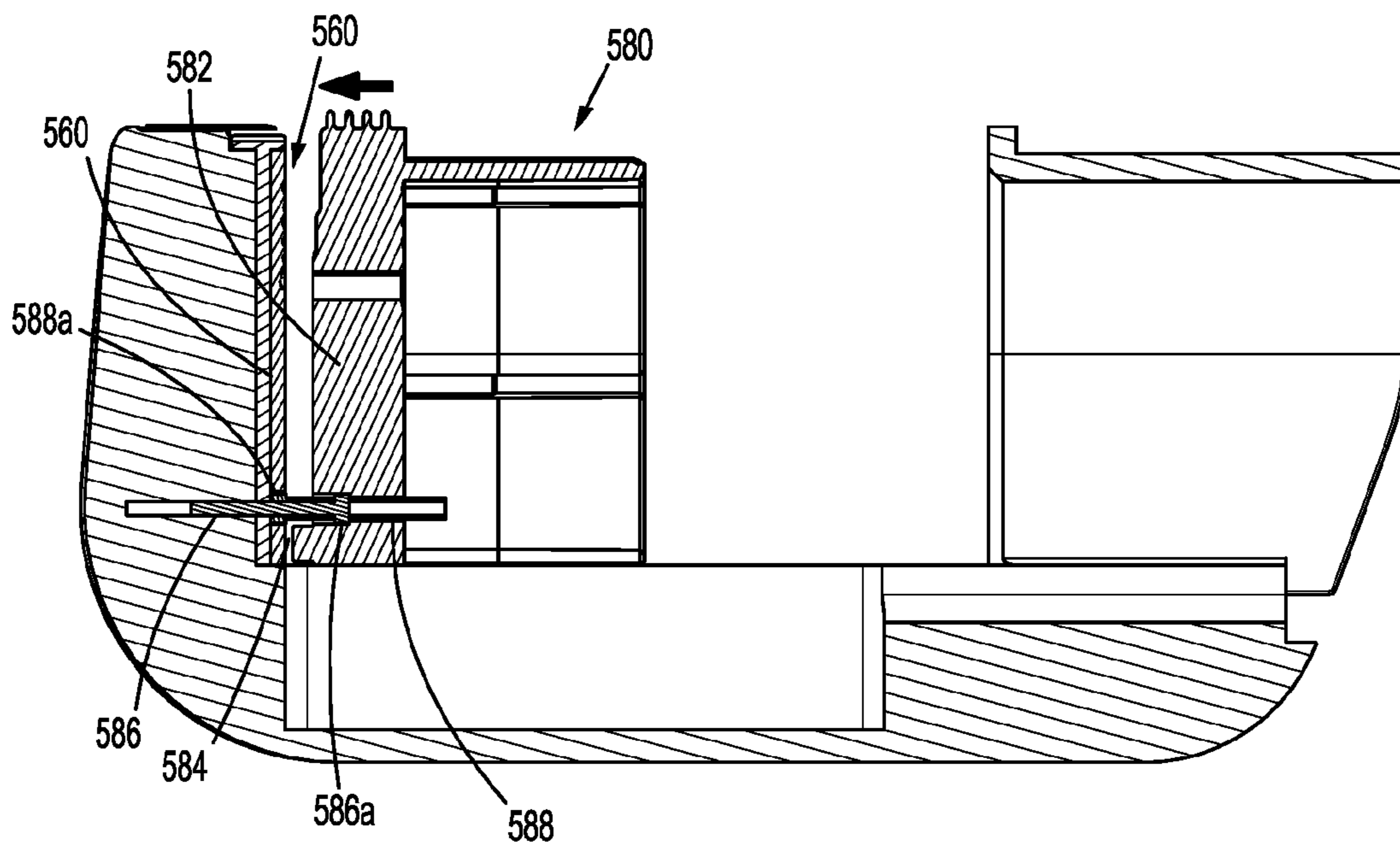


FIG. 21

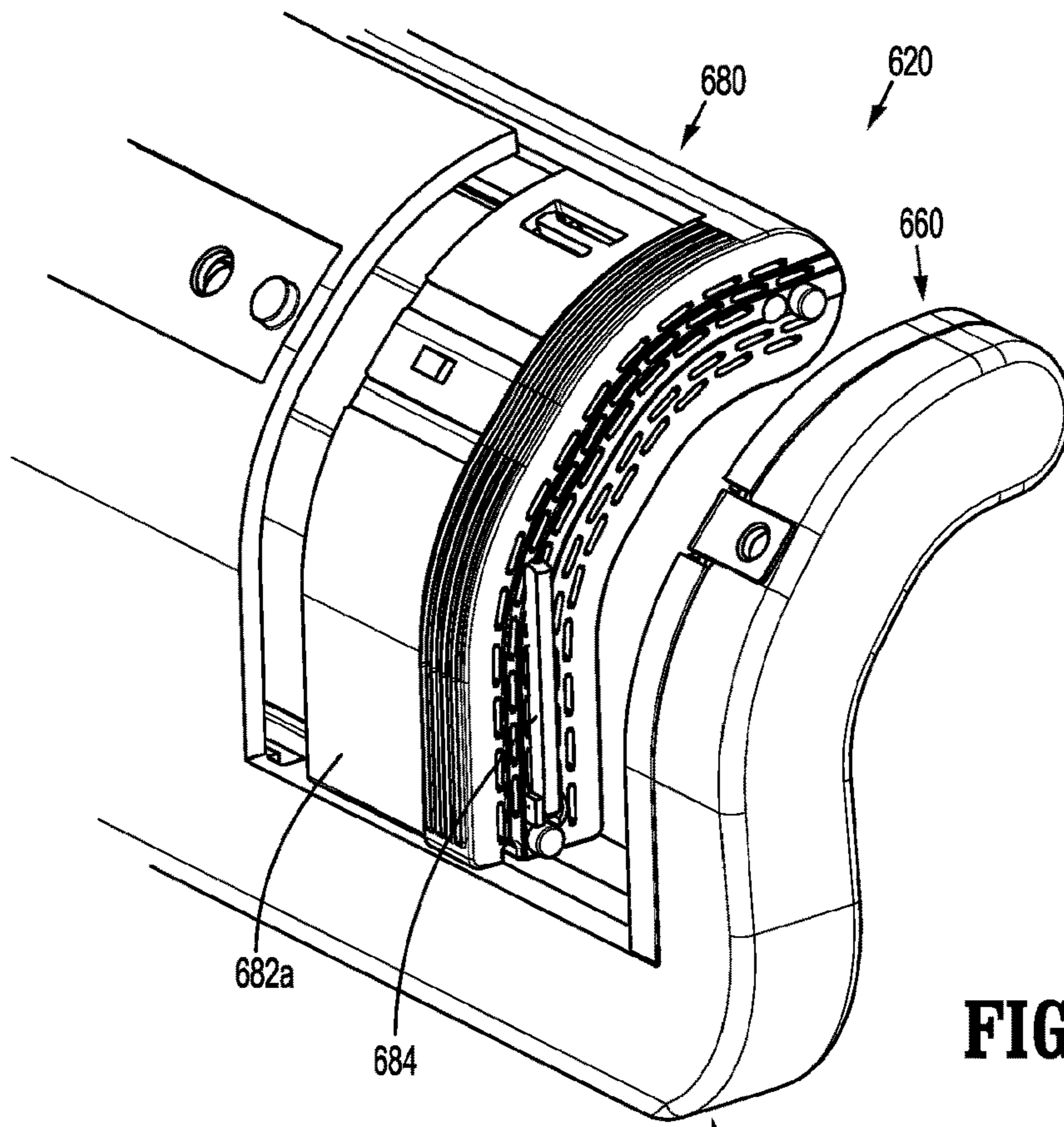


FIG. 22

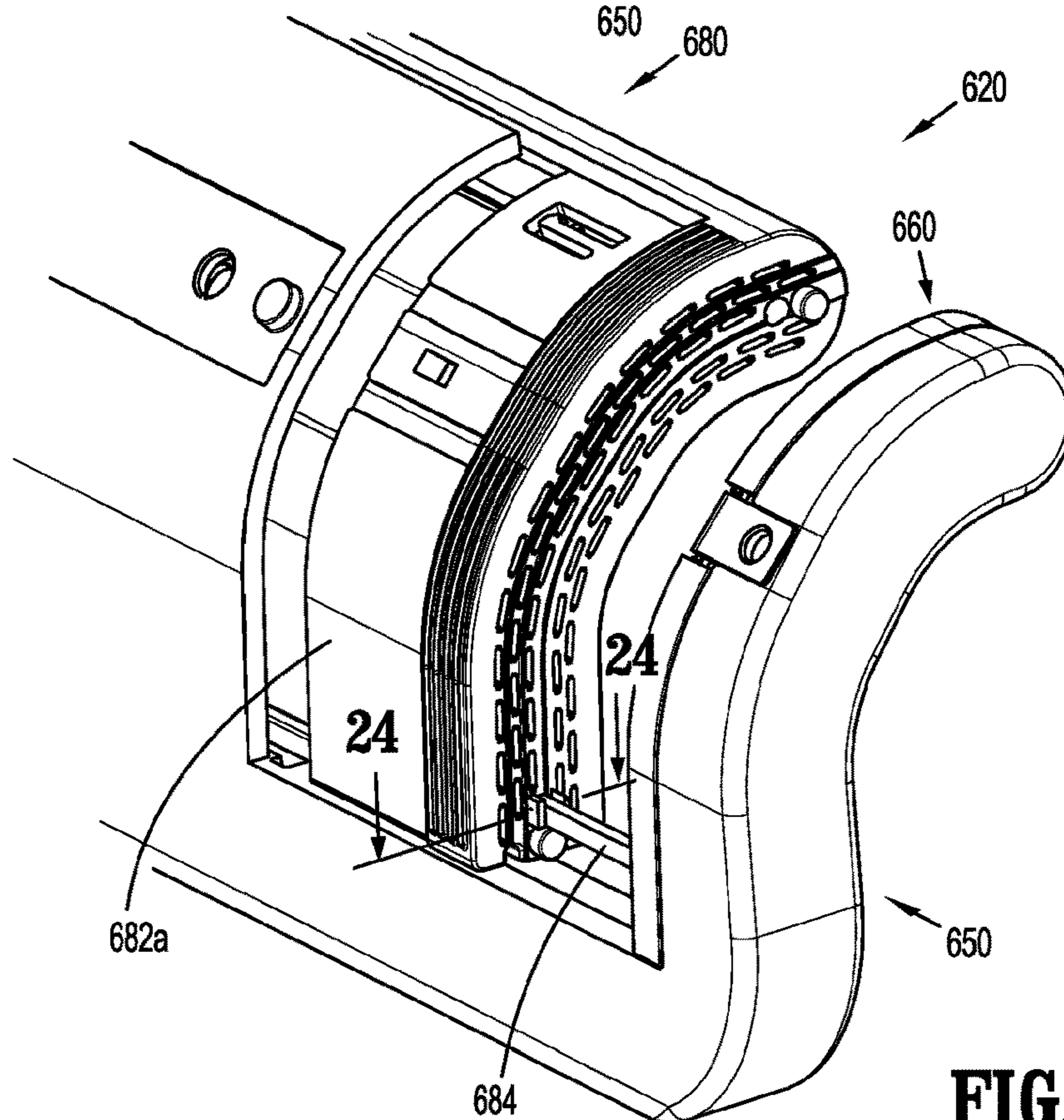


FIG. 23

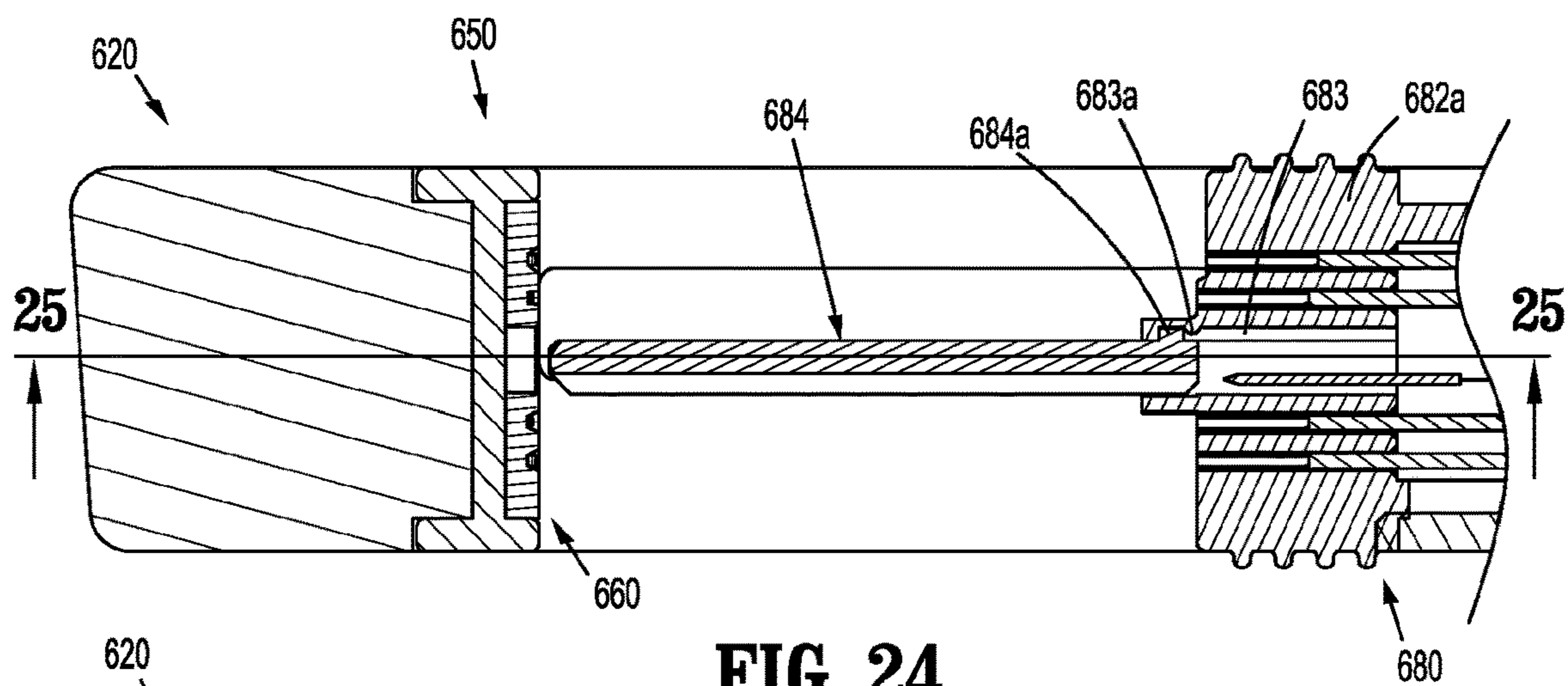


FIG. 24

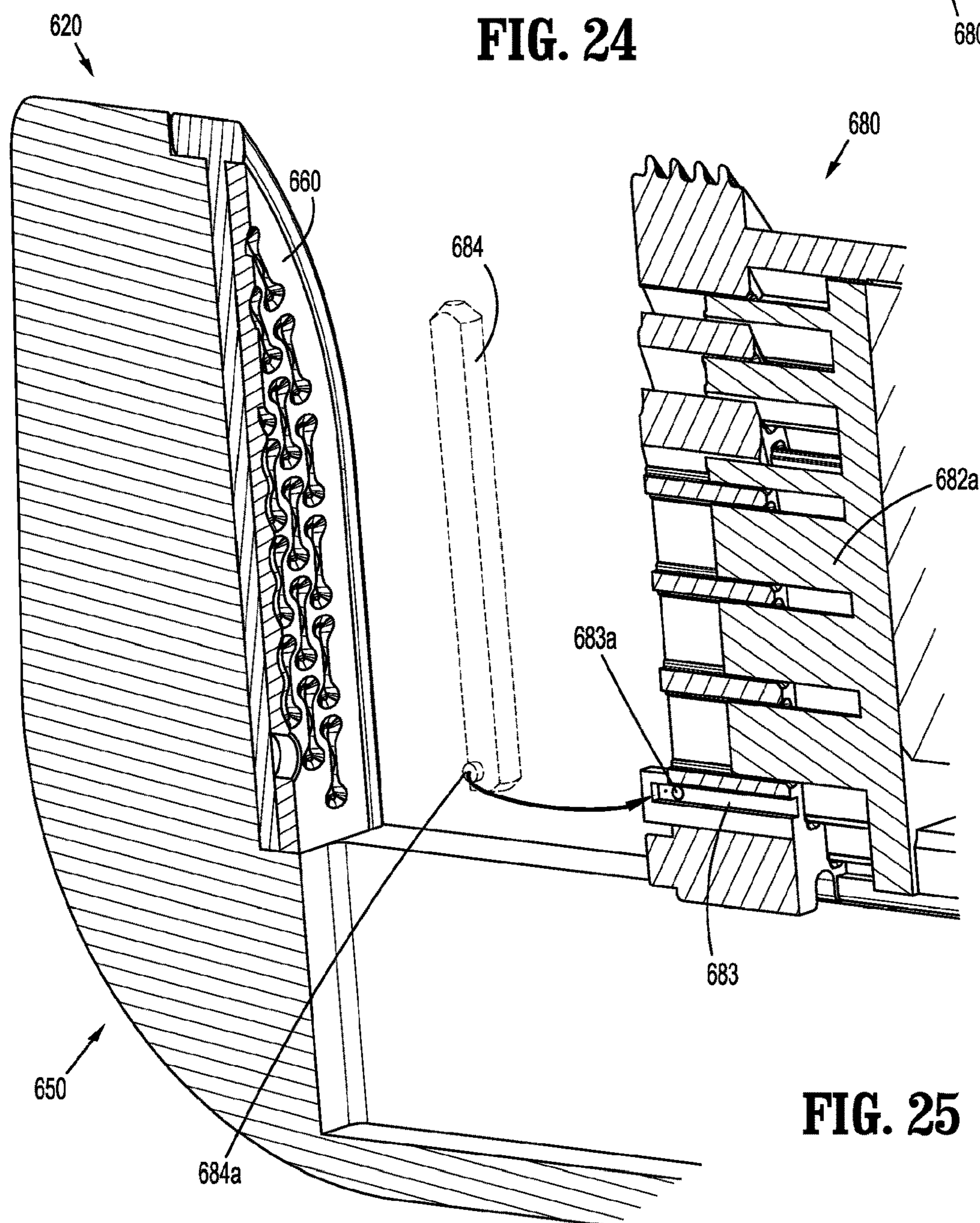
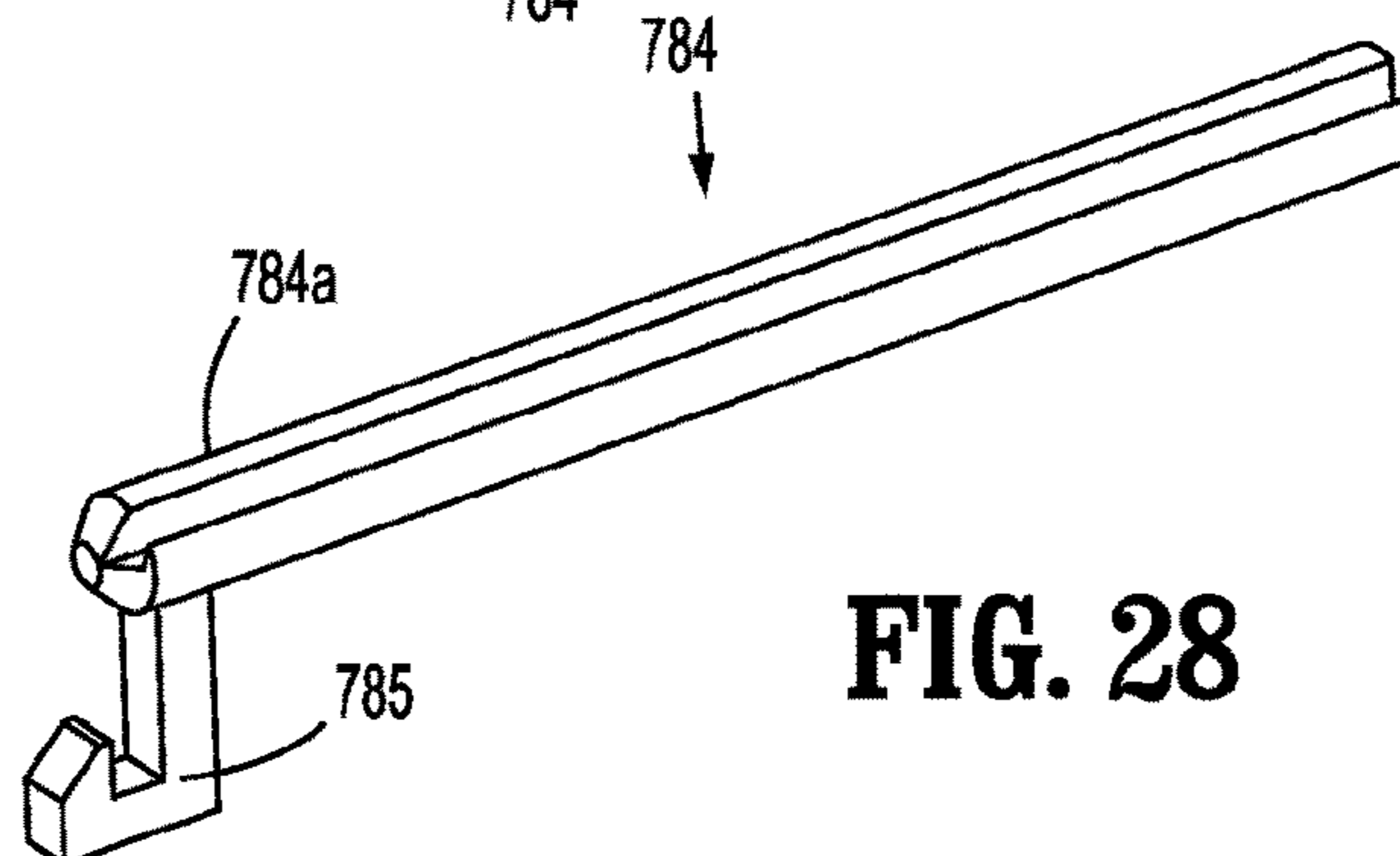
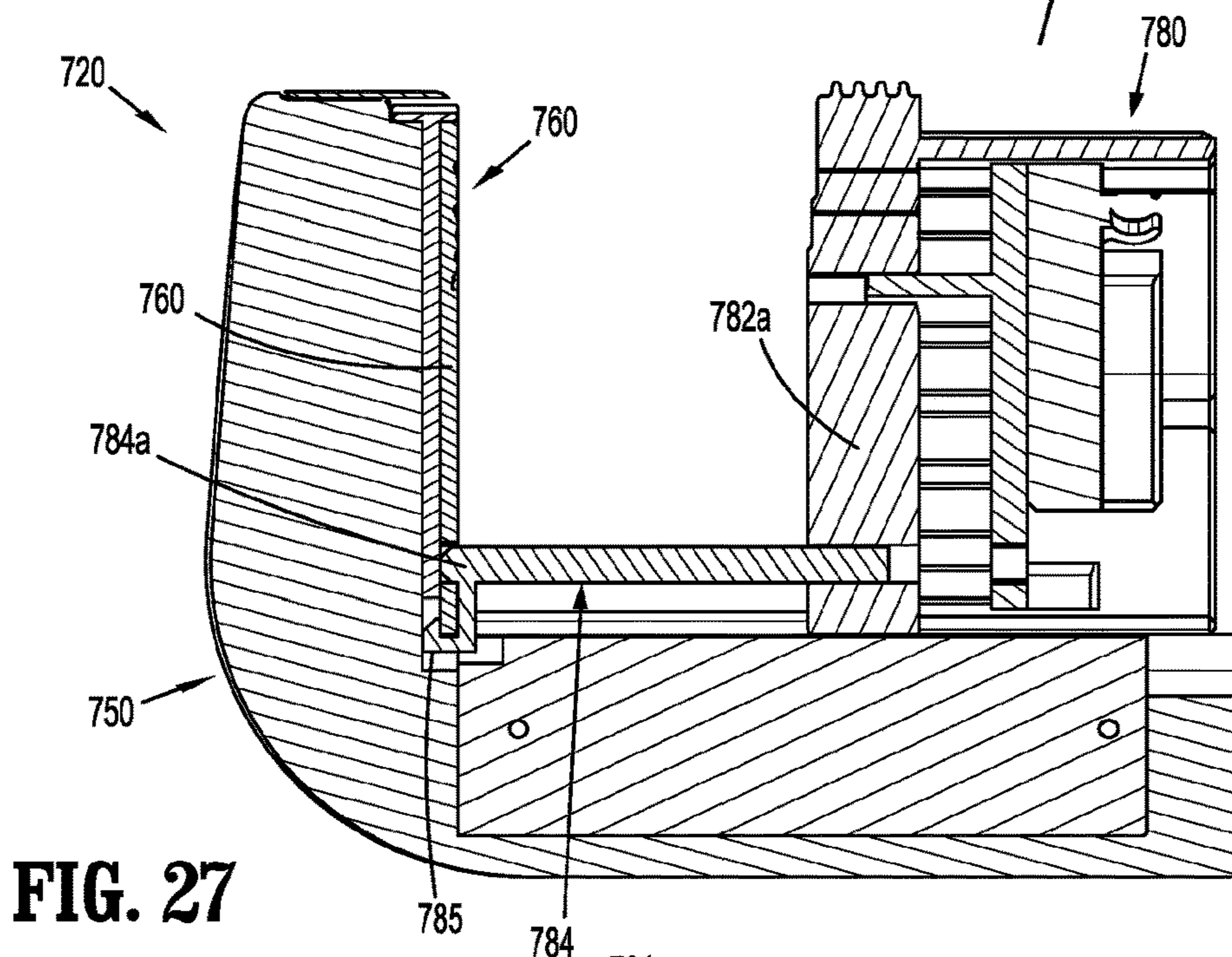
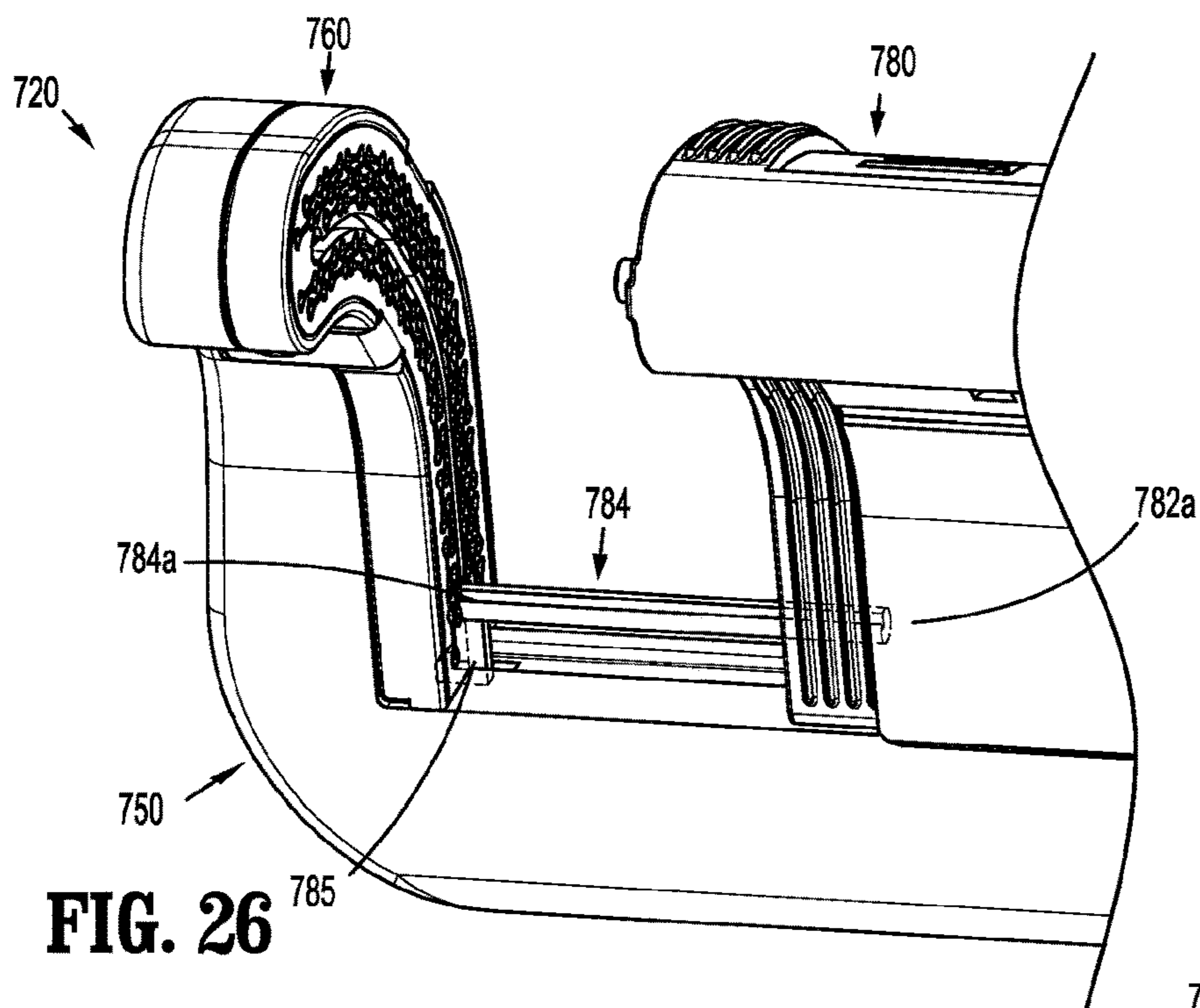


FIG. 25



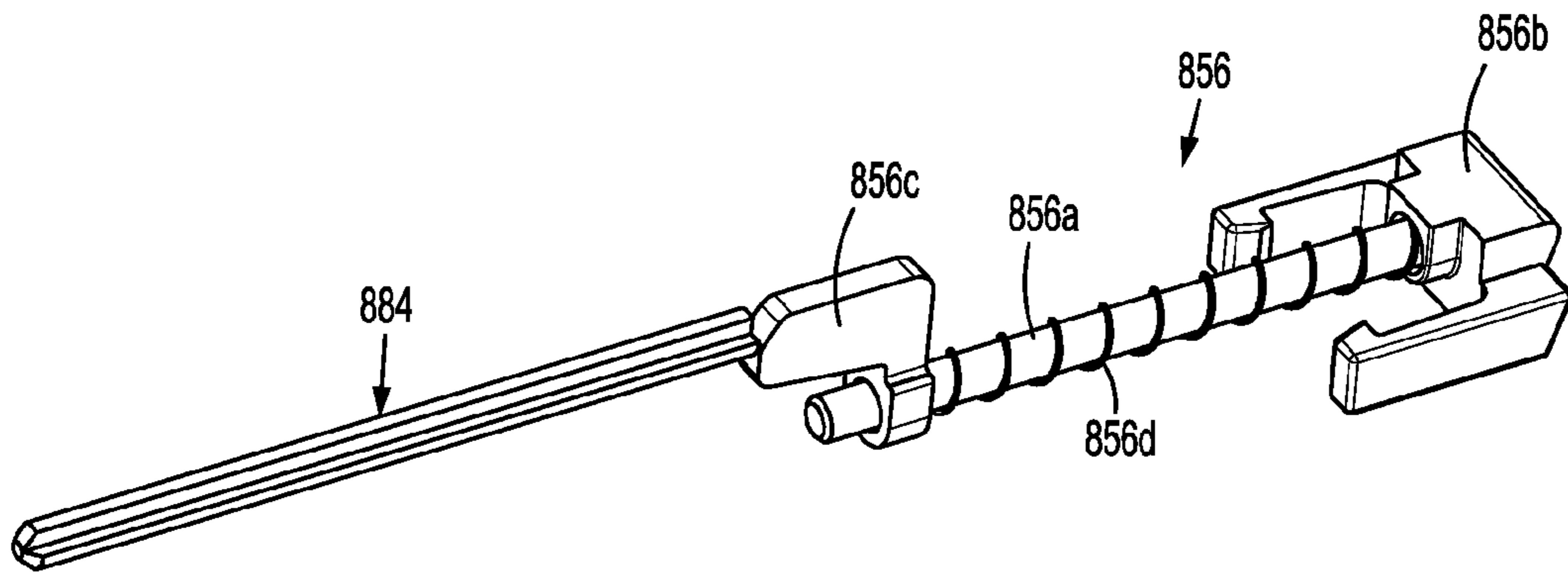


FIG. 29

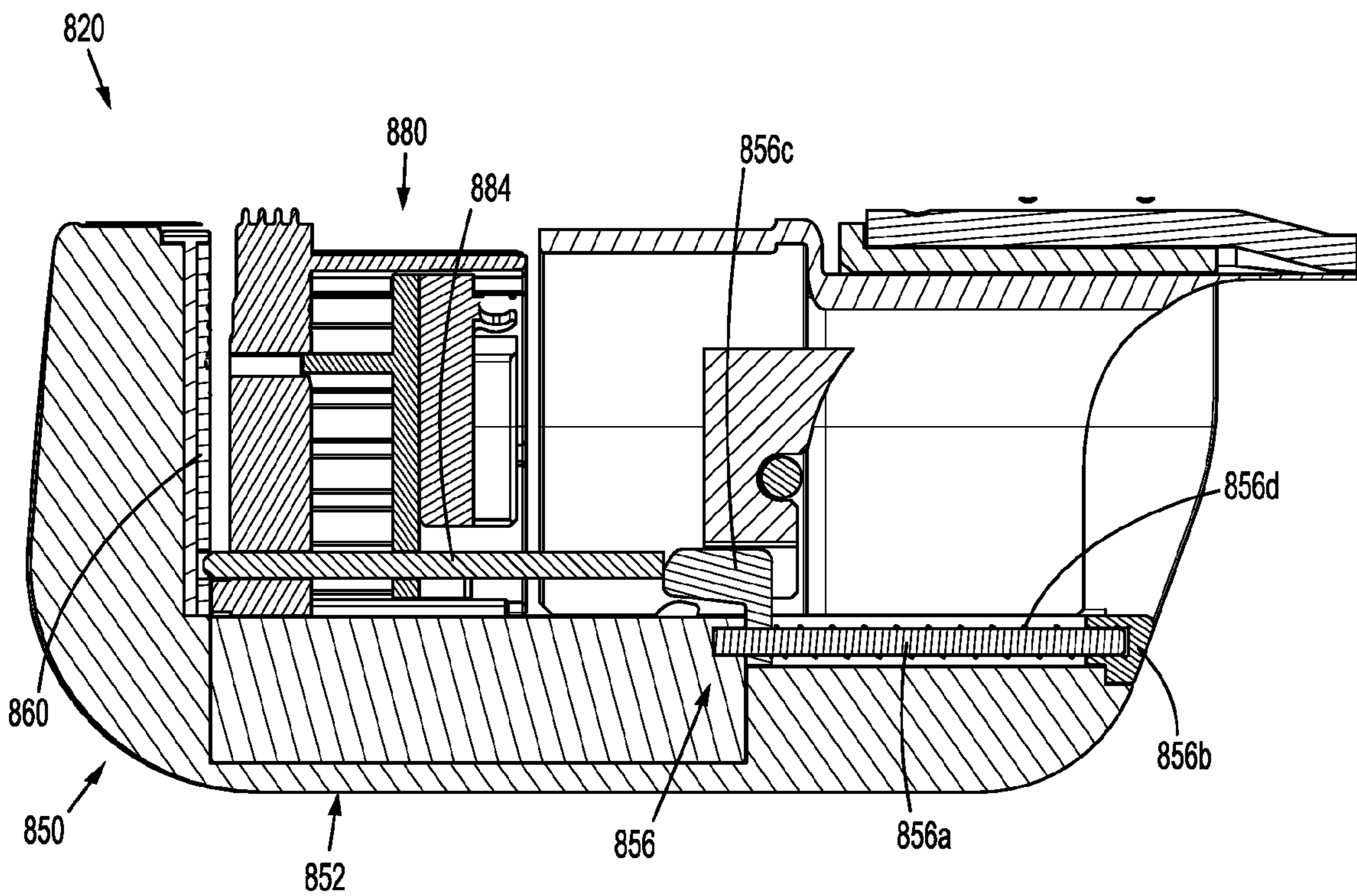


FIG. 30

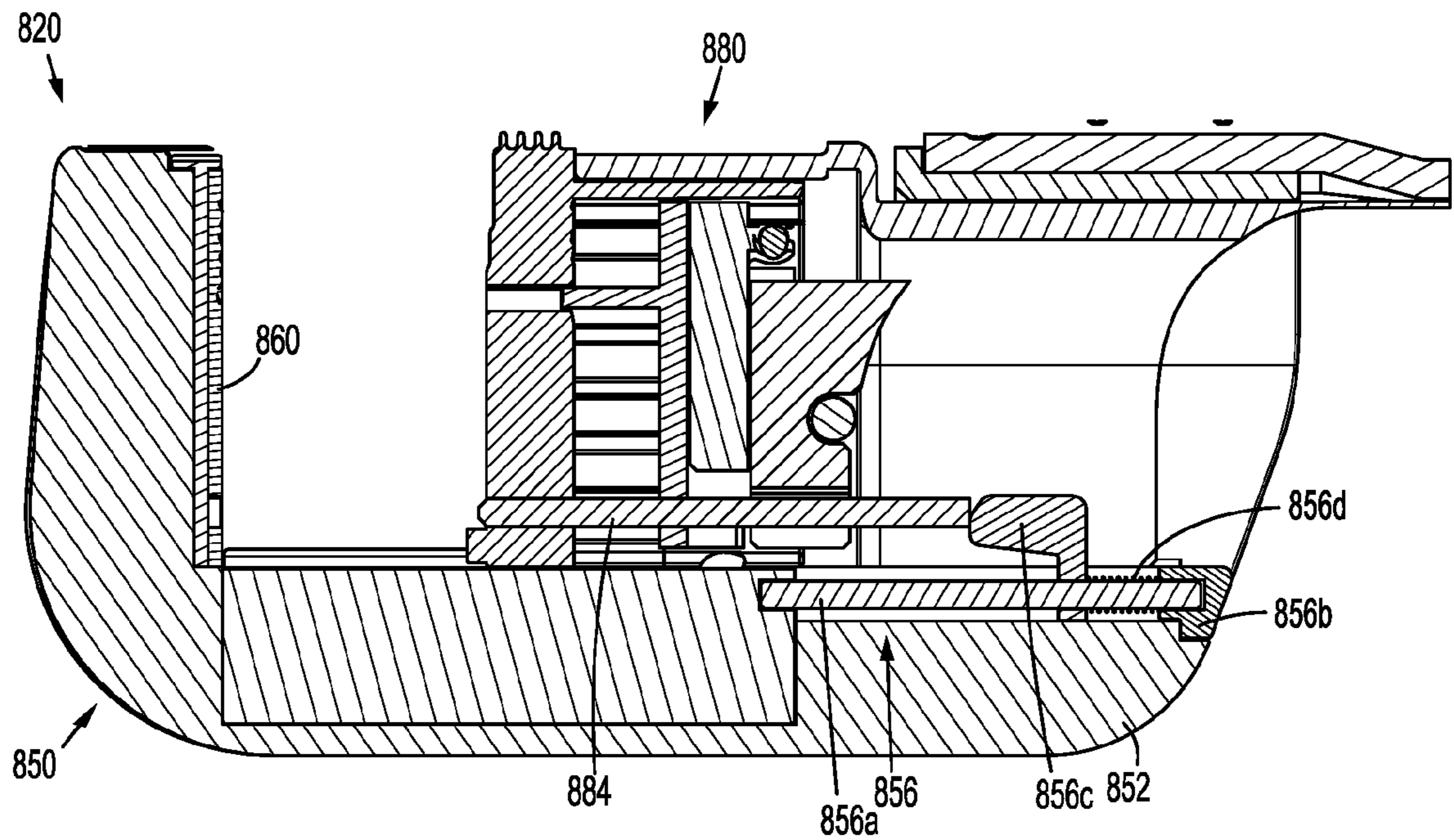


FIG. 31

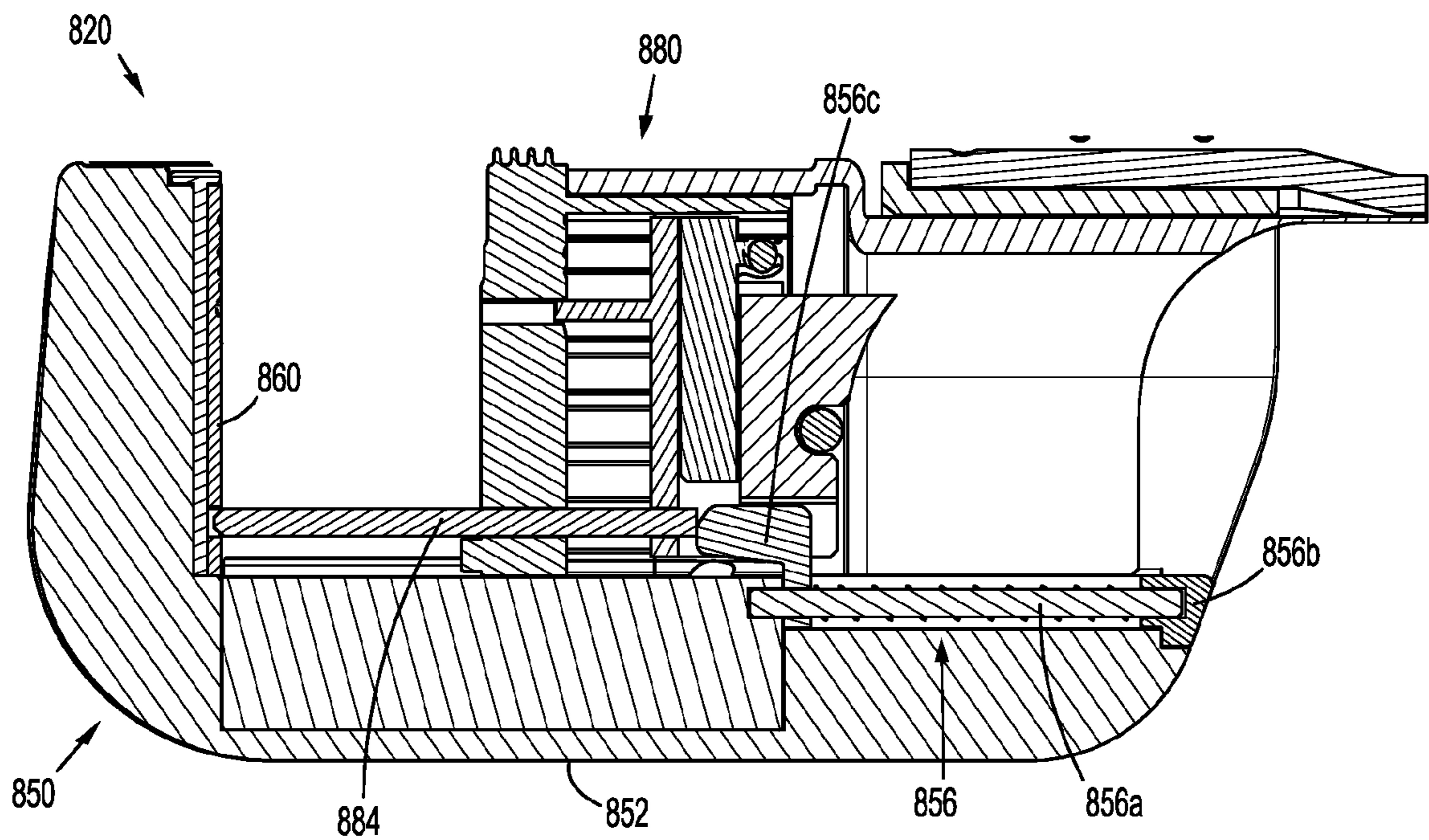


FIG. 32

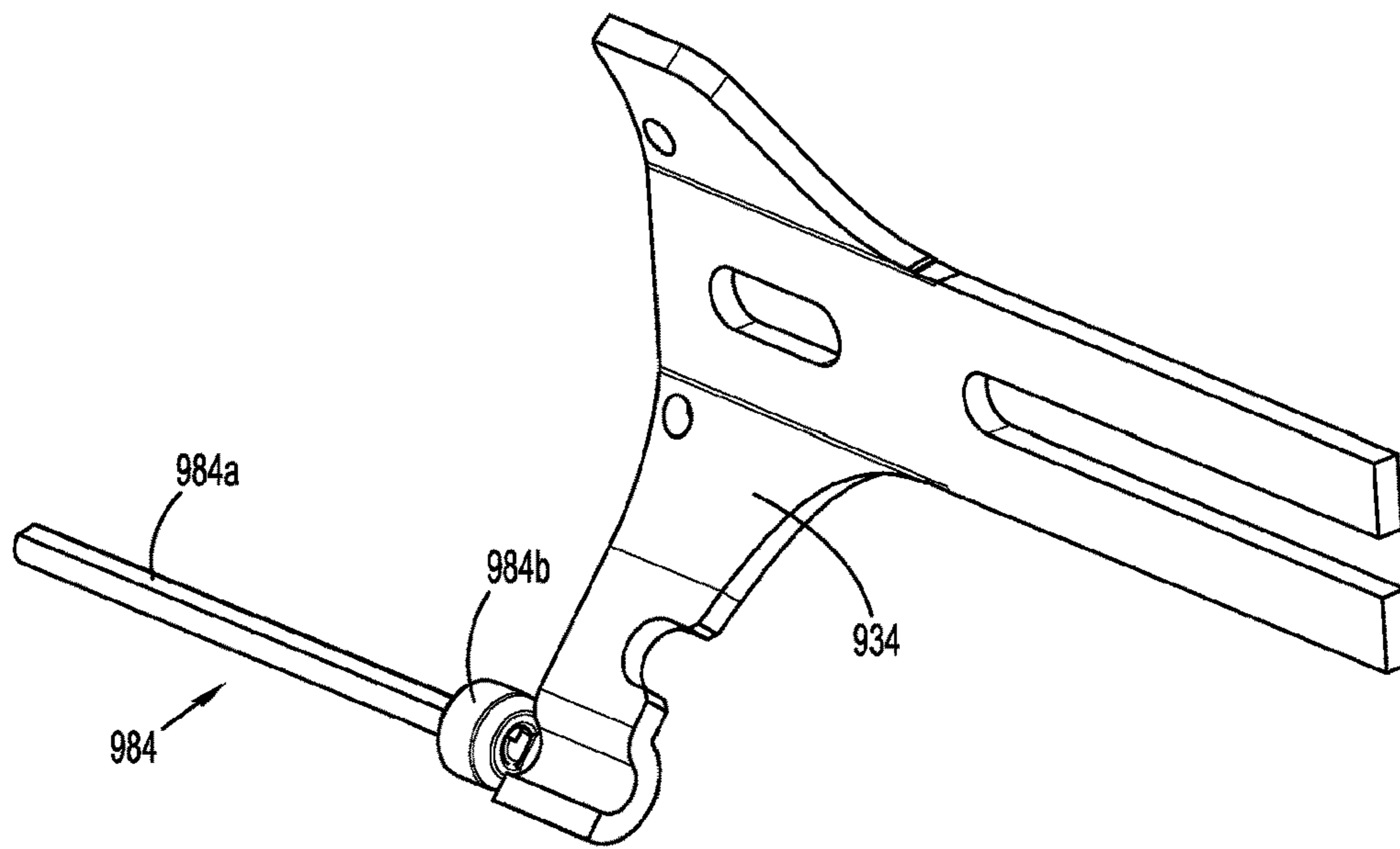


FIG. 33

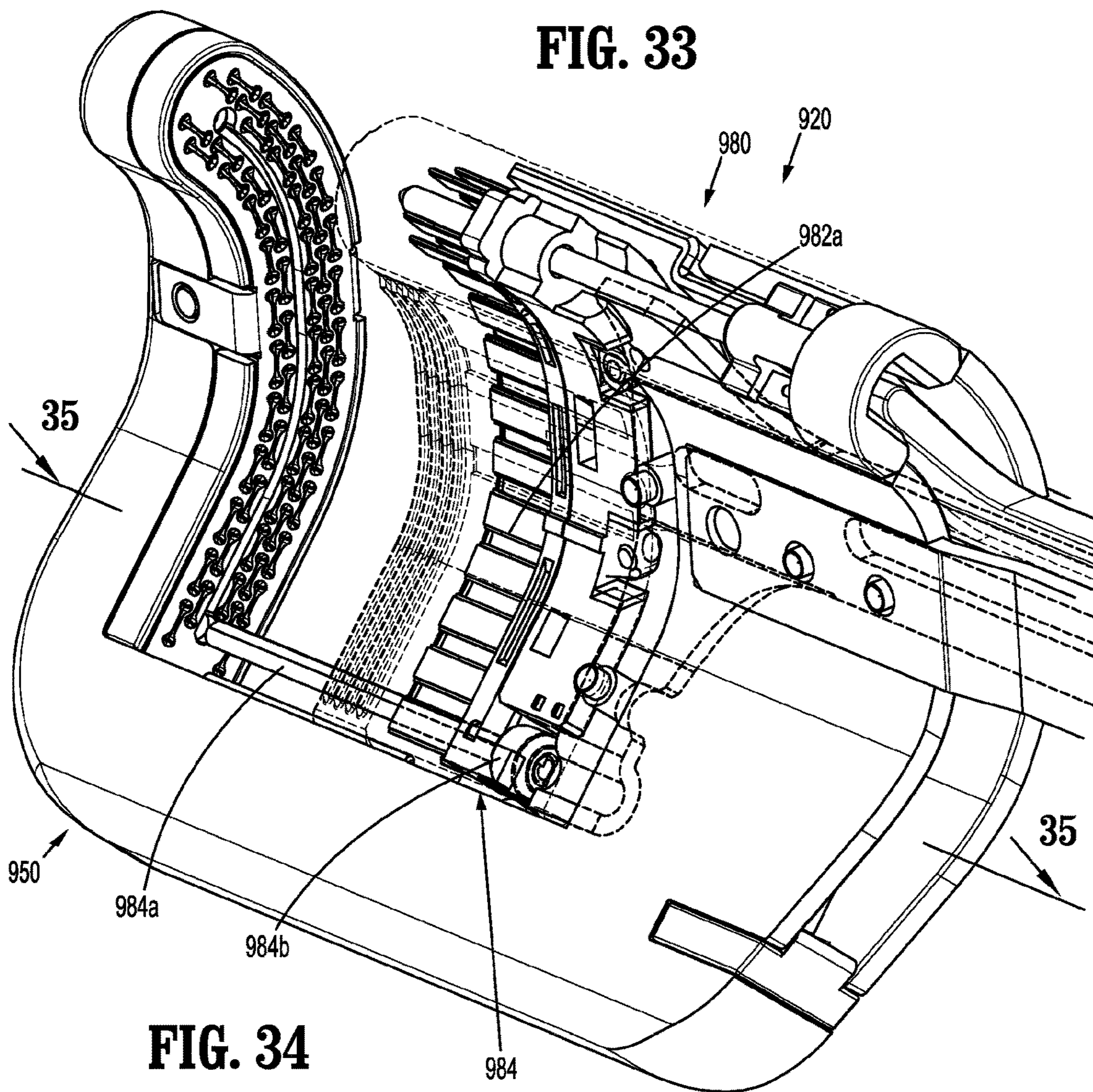


FIG. 34

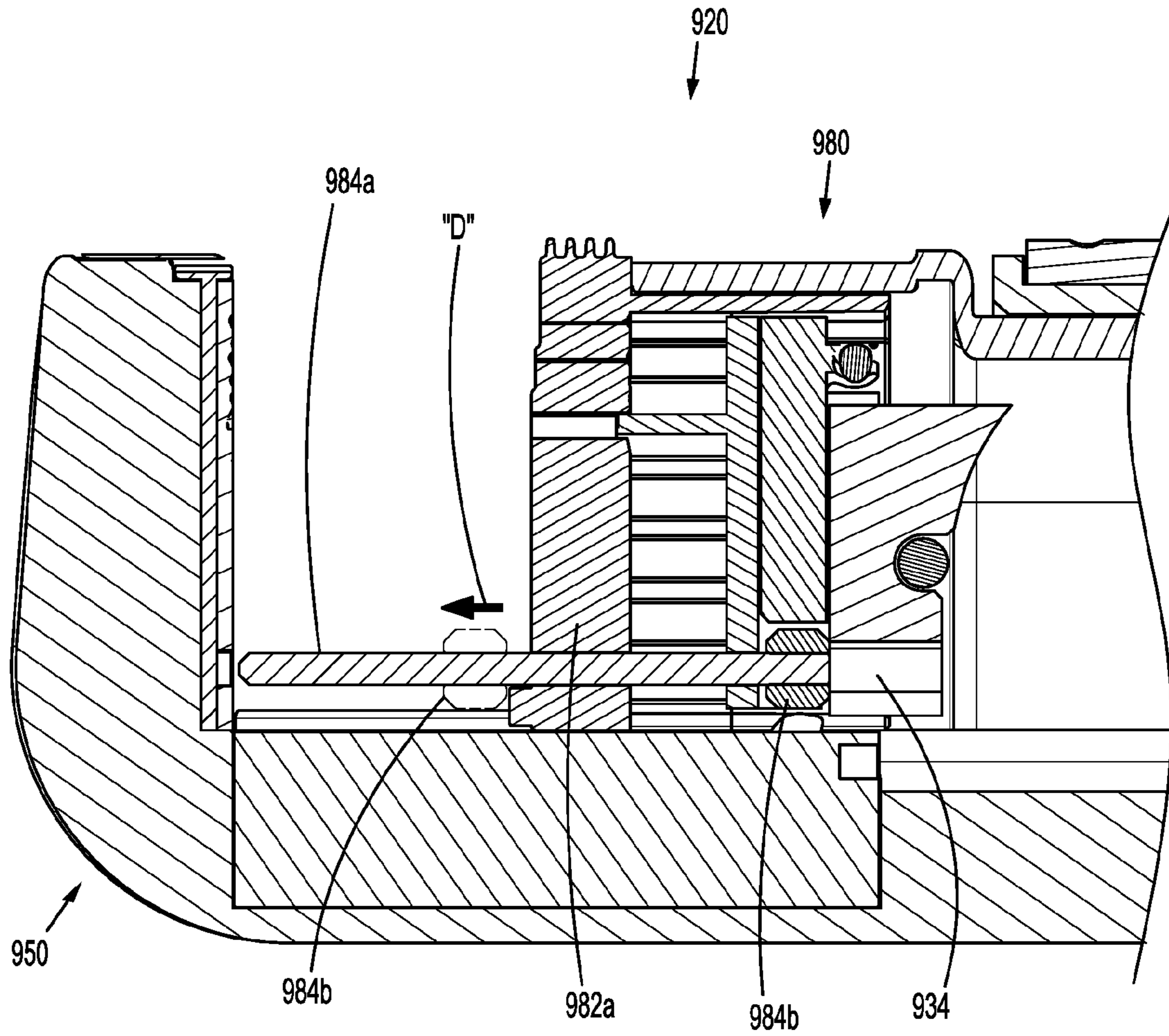


FIG. 35

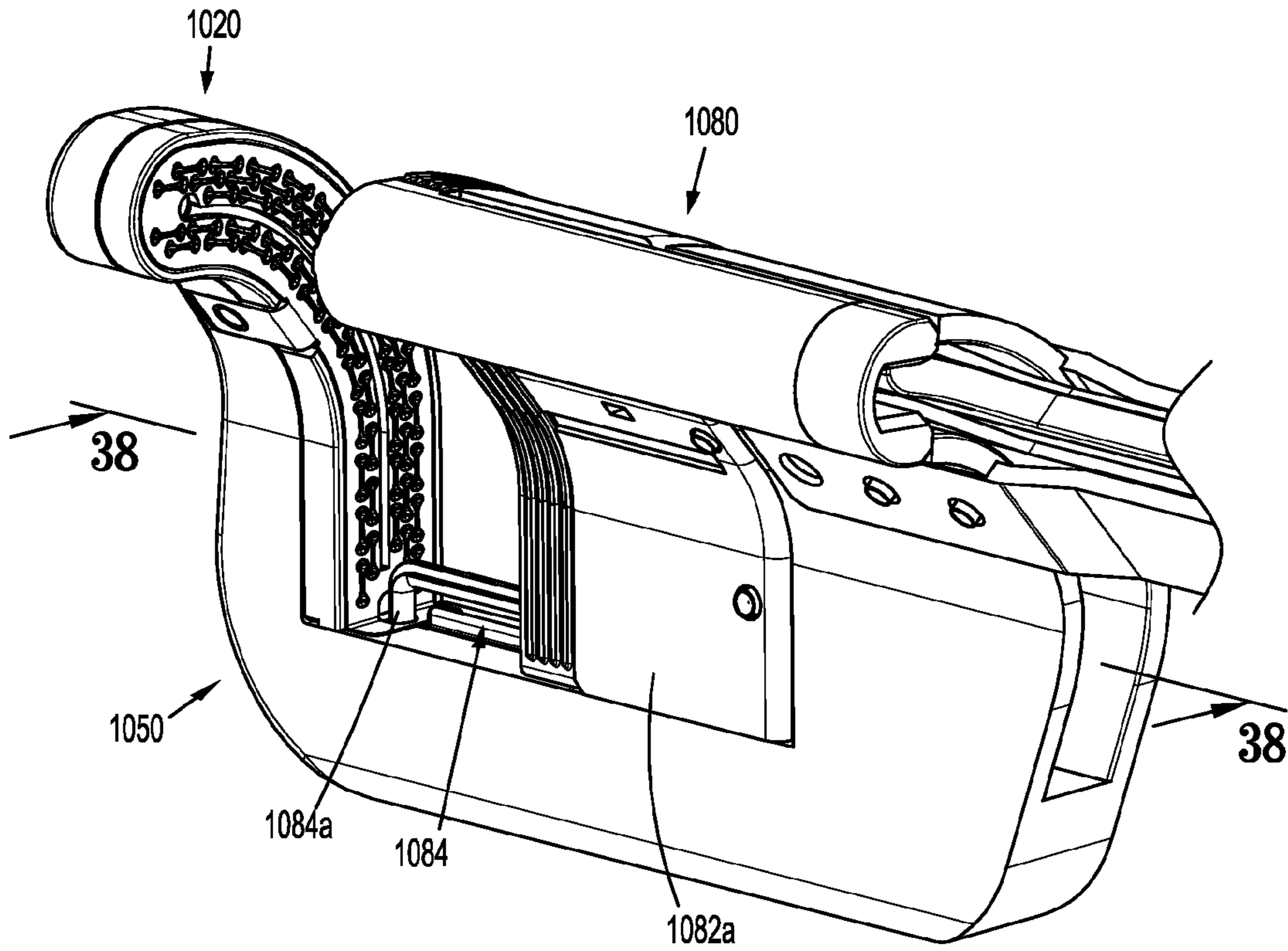


FIG. 36

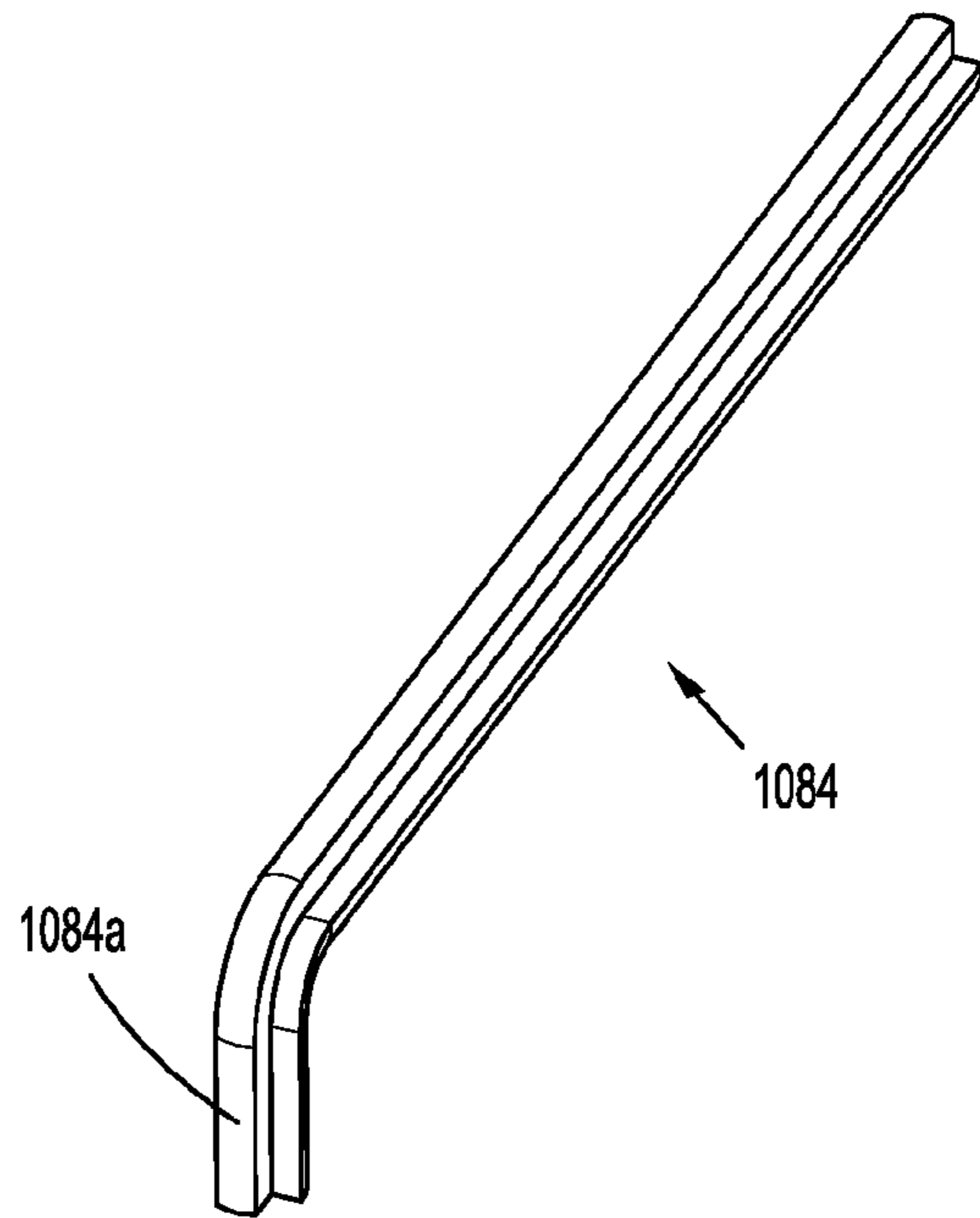


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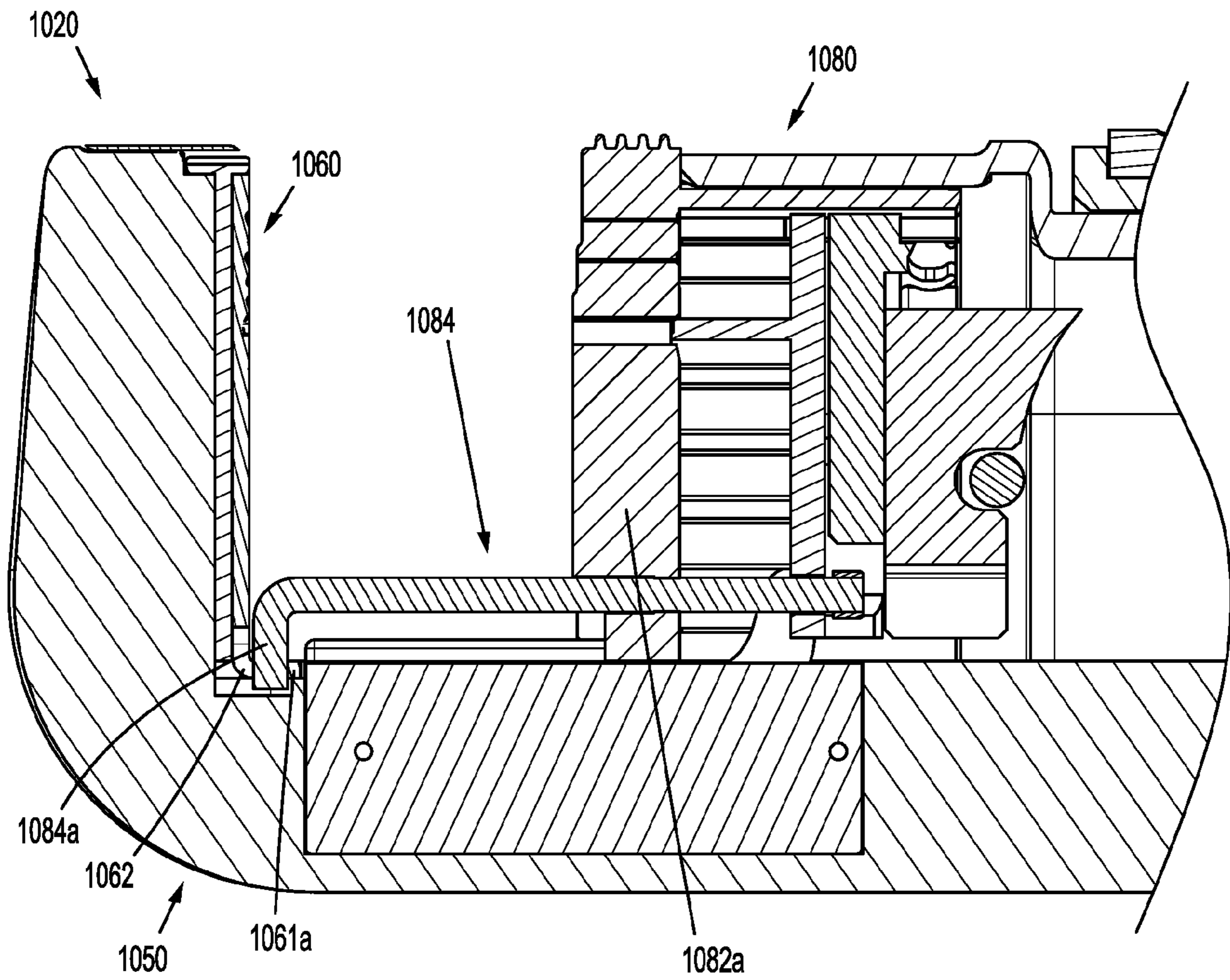


FIG. 38

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TISSUE GUIDE FOR CURVED END EFFECTORS

CROSS-REFERENCE TO RELATED APPLICATIONS

This is a National Stage Application of PCT/CN2020/074175 under 35 U.S.C. § 371(a) filed on Feb. 3, 2020, the disclosure of which is incorporated herein by reference in its entirety.

FIELD

The present disclosure relates generally to a surgical instrument and, more specifically, to a surgical stapling instrument for clamping, and joining and/or cutting tissue.

BACKGROUND

Surgical stapling instruments used for applying parallel rows of staples through compressed living tissue are well known in the art, and are commonly used, for example, for closure of tissue or organs during surgical procedures for performing anastomoses and/tissue transection or resection. Surgical stapling instruments are often used for occlusion of organs in thoracic and abdominal procedures. Typically, surgical stapling instruments include an anvil assembly, a cartridge assembly for supporting an array of surgical staples, an approximation mechanism for approximating the anvil and cartridge assemblies, and a firing mechanism for ejecting the surgical staples from the cartridge assembly.

The cartridge assembly may include an alignment pin and a tissue guide for retaining tissue between the cartridge and anvil assemblies and for aligning and maintaining alignment between the cartridge and anvil assemblies during approximation and firing of the surgical stapling instrument.

To ensure alignment of the cartridge and the anvil assemblies, it would be beneficial to have a surgical stapling instrument that includes features that restrict unnecessary movement of the cartridge and anvil assemblies and maintain alignment of the cartridge and anvil assembly during actuation of surgical stapling instrument.

SUMMARY

The present disclosure relates to a surgical stapling instrument comprising an elongate body portion defining a longitudinal axis and having a proximal portion and a distal portion and an end effector supported on the distal portion of the elongated body portion. The end effector includes a housing having a base portion and a jaw portion, an anvil assembly supported on the jaw portion, a cartridge assembly releasably supported on the base portion, and a pusher assembly disposed within the base portion of the housing of the end effector. The base portion secured to the distal portion of the elongate body portion and the cartridge assembly including a housing and a tissue guide. The tissue guide being moveable from a retracted position to an advanced position relative to the housing of the cartridge assembly. The pusher assembly is configured to move the tissue guide from the retracted position to the advanced position such that the tissue guide engages the anvil assembly.

In embodiments, the tissue guide includes a feature for engaging the flange.

The present disclosure further relates to a surgical stapling instrument comprising an elongate body portion defining a

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longitudinal axis and having a proximal portion and a distal portion and an end effector supported on the distal portion of the elongated body portion. The end effector includes a housing having a base portion and a jaw portion, an anvil assembly supported on the jaw portion, and a cartridge assembly releasably supported on the base portion and moveable between a retracted position and an advanced position. The base portion is secured to the distal portion of the elongate body portion. The cartridge assembly includes a tissue contacting surface and a tissue guide extending from the tissue contacting surface. The tissue guide is spaced from the anvil assembly when in the retracted position and is in engagement with the anvil assembly when in the advanced position.

In embodiments, a free end of the tissue guide is sharpened.

The present disclosure relates to a surgical stapling instrument comprising an elongate body portion defining a longitudinal axis and having a proximal portion and a distal portion and an end effector supported on the distal portion of the elongated body portion. The end effector includes a housing having a base portion and a jaw portion, an anvil assembly supported on the jaw portion, a cartridge assembly releasably supported on the base portion, and a tissue guide selectively extendable from the cartridge assembly. The base portion is secured to the distal portion of the elongate body portion. The tissue guide is configured to engage the anvil assembly as the cartridge assembly is secured to the base portion to cause deployment of the tissue guide.

In embodiments, the anvil assembly includes a flange and the tissue guide engages the flange as the cartridge assembly is secured to the base portion.

In addition, the present disclosure relates to a surgical stapling instrument comprising an elongate body portion defining a longitudinal axis and having a proximal portion and a distal portion and an end effector supported on the distal portion of the elongated body portion. The end effector includes a housing having a base portion and a jaw portion, an anvil assembly supported on the jaw portion, a cartridge assembly releasably supported on the base portion, and a tissue guide assembly selectively extendable relative to the cartridge assembly. The base portion includes at least one tab. The tissue guide assembly is configured to engage the at least one tab of the base portion as the cartridge assembly is secured to the base portion to cause deployment of the tissue guide.

In embodiments, the tissue guide assembly includes a tissue guide portion and a base portion. The base portion may define at least one slot for receiving the at least one tab of the base portion. The tissue guide assembly may further include a spring for biasing the tissue guide portion distally relative to the base portion.

The present disclosure relates to a surgical stapling instrument comprising an elongate body portion defining a longitudinal axis and having a proximal portion and a distal portion and an end effector supported on the distal portion of the elongated body portion. The end effector includes a housing having a base portion and a jaw portion, an anvil assembly supported on the jaw portion, a cartridge assembly releasably supported on the base portion, and a tissue guide assembly selectively extendable relative to the cartridge assembly. The tissue guide assembly includes a first member and a second member. The first member telescopes relative to the second member between retracted and extended positions.

The present disclosure further relates to a surgical stapling instrument comprising an elongate body portion defining a

longitudinal axis and having a proximal portion and a distal portion and an end effector supported on the distal portion of the elongated body portion. The end effector includes a housing having a base portion and a jaw portion, an anvil assembly supported on the jaw portion, a cartridge assembly releasably supported on the base portion, and a tissue guide assembly selectively extendable relative to the cartridge assembly. The base portion including at least one tab. The tissue guide assembly includes a tissue guide pivotally secured to the cartridge assembly.

In embodiments, the tissue guide is slidably disposed relative to the cartridge assembly.

Further, the present disclosure relates to a surgical stapling instrument comprising an elongate body portion defining a longitudinal axis and having a proximal portion and a distal portion and an end effector supported on the distal portion of the elongated body portion. The end effector includes a housing having a base portion and a jaw portion, an anvil assembly supported on the jaw portion, a cartridge assembly releasably supported on the base portion, and a tissue guide assembly selectively extendable relative to the cartridge assembly. The base portion includes at least one tab. The tissue guide assembly is configured to engage the at least one tab of the base portion as the cartridge assembly is secured to the base portion to cause deployment of the tissue guide.

The present disclosure relates to a surgical stapling instrument comprising an elongate body portion defining a longitudinal axis and having a proximal portion and a distal portion and an end effector supported on the distal portion of the elongated body portion. The end effector includes a housing having a base portion and a jaw portion, an anvil assembly supported on the jaw portion, a cartridge assembly releasably supported on the base portion, and a tissue guide selectively extendable relative to the cartridge assembly. The base portion includes at least one tab. The tissue guide is configured to engage at least one of the anvil assembly or the base portion as the cartridge assembly is secured to the base portion.

In embodiments, the tissue guide includes a snap feature and the base portion defines an opening for receiving the snap feature. The tissue guide may include a bent portion and the base portion may define an opening for receiving the bent portion.

The present disclosure relates to a surgical stapling instrument comprising an elongate body portion defining a longitudinal axis and having a proximal portion and a distal portion and an end effector supported on the distal portion of the elongated body portion. The end effector includes a housing having a base portion and a jaw portion, an anvil assembly supported on the jaw portion, a cartridge assembly releasably supported on the base portion, a tissue guide assembly selectively extendable relative to the cartridge assembly, and a clamping member disposed within the housing and moveable between a retracted position and an advanced position. The base portion includes at least one tab. The tissue guide assembly may include a tissue guide and a bushing slidably received about the tissue guide. Movement of the clamping member from the retracted position to the advance position may advance the bushing about the tissue guide.

BRIEF DESCRIPTION OF THE DRAWINGS

Various embodiments of the presently disclosed surgical stapling instrument are disclosed herein with reference to the drawings, wherein:

FIG. 1 is a perspective view a surgical stapling instrument with an end effector including a removable cartridge assembly having tissue guide according to an exemplary embodiment of the present disclosure;

FIG. 2 is an enlarged view of the area of detail indicated in FIG. 1 with the end effector in the open position and a removable cartridge assembly separated from the end effector;

FIG. 3 is a perspective view of an anvil assembly and a tissue guide member of the end effector shown in FIG. 2;

FIG. 4 is an enlarged side view of the end effector shown in FIG. 2 with the tissue guide member in a partially advanced position;

FIG. 5 is a perspective view of a portion of the end effector shown in FIG. 2 with the tissue guide member in an advanced position;

FIG. 6 is a cross-sectional side view taken along line 6-6 shown in FIG. 5;

FIG. 7 is a perspective view of an end effector according to another exemplary embodiment of the present disclosure in an open position;

FIG. 8 is an enlarged view of the area of detail indicated in FIG. 7;

FIG. 9 is a perspective view of an end effector including an anvil assembly and a removable cartridge assembly having a tissue guide member according to another exemplary embodiment of the present disclosure;

FIG. 10 is a perspective view of the anvil assembly and the tissue guide member of the end effector shown in FIG. 9;

FIG. 11 is a perspective front view of a removable cartridge assembly according to the present disclosure with a tissue guide assembly in a retracted position;

FIG. 12 is a perspective view of a tissue guide assembly of the removable cartridge assembly shown in FIG. 11;

FIG. 13 is a perspective view of an end effector according to the present disclosure prior to loading of the removable cartridge assembly shown in FIG. 11;

FIG. 14 is a perspective view of the end effector shown in FIG. 13 in an open position.

FIG. 15 is a perspective view of the end effector shown in FIG. 13 in a closed position;

FIG. 16 is a perspective view of an end effector including a removable cartridge assembly having a tissue guide assembly according to another exemplary embodiment of the present disclosure;

FIG. 17 is an enlarged view of the area of detail indicated in FIG. 16;

FIG. 18 is a perspective view of an end effector including a removable cartridge assembly having a tissue guide assembly according to another exemplary embodiment of the present disclosure;

FIG. 19 is a perspective view of the tissue guide assembly shown in FIG. 18, with parts separated;

FIG. 20 is a cross-sectional side view of the end effector shown in FIG. 18 with the removable cartridge assembly in an open position;

FIG. 21 is a cross-sectional side view of the end effector shown in FIG. 18 with the removable cartridge assembly in a closed position;

FIG. 22 is a perspective view of an end effector including a removable cartridge assembly having a tissue guide assembly according to another exemplary embodiment of the present disclosure with a tissue guide in an upright position;

FIG. 23 is a perspective view of the end effector shown in FIG. 22 with the tissue guide in a pivoted position;

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FIG. 24 is a cross-sectional view taken along line 24-24 shown in FIG. 23;

FIG. 25 is a cross-sectional view taken along line 25-25 shown in FIG. 24;

FIG. 26 is a perspective view of an end effector including a removable cartridge assembly and a tissue guide member according to yet another exemplary embodiment of the present disclosure;

FIG. 27 is a cross-sectional side view of the end effector shown in FIG. 26;

FIG. 28 is a perspective view of the tissue guide member shown in FIG. 26;

FIG. 29 is a perspective view of a tissue guide assembly according to another exemplary embodiment of the present disclosure;

FIG. 30 is a cross-sectional side view of an end effector including a removable cartridge assembly and the tissue guide assembly shown in FIG. 29, with the removable cartridge assembly in a partially loaded condition;

FIG. 31 is a cross-sectional side view of the end effector shown in FIG. 29, with the removable cartridge assembly in a fully loaded condition;

FIG. 32 is a cross-sectional side view of the end effector shown in FIG. 29, with the tissue guide assembly in an advanced position;

FIG. 33 is a perspective view of a tissue guide assembly and a distal end of a pusher member according to another exemplary embodiment of the present disclosure;

FIG. 34 is a perspective view of an end effector including the tissue guide assembly and pusher member shown in FIG. 33;

FIG. 35 is a cross-sectional side view taken along line 35-35 shown in FIG. 34;

FIG. 36 is a perspective view of an end effector including a removable cartridge assembly having a tissue guide according to another exemplary embodiment of the present disclosure;

FIG. 37 is a perspective view of the tissue guide shown in FIG. 36; and

FIG. 38 is a cross-sectional side view taken along line 38-38 shown in FIG. 36.

DETAILED DESCRIPTION

Embodiments of the presently disclosed replaceable cartridge assembly for surgical stapling instruments are described in detail with reference to the drawings, wherein like reference numerals designate corresponding elements in each of the several views. In the drawings and the description that follow, the term “proximal” refers to the end of the surgical stapling instrument that is closer to the clinician, whereas the term “distal” refers to the end of the surgical stapling instrument that is farther from the clinician. In addition, the term “clinician” is used generally to refer to medical personnel including doctors, nurses, and support personnel.

It should be appreciated that the instruments described and illustrated herein are configured to fire surgical staples against an anvil surface; however, aspects of the present disclosure are equally applicable with other forms of staples, fasteners, clips, as well as two part fasteners, made of metallic and/or polymeric materials.

Embodiments of the presently disclosed surgical stapling instruments include a curved end effector having a curved anvil assembly and a curved cartridge assembly. It is envi-

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sioned that the aspects of the present disclosure may be suitable for use with surgical stapling instruments having linear end effectors.

With initial reference to FIG. 1, an exemplary embodiment of the presently disclosed surgical stapling instrument is shown generally as stapling instrument 10. The stapling instrument 10 includes a body 12 defining a stationary handle 14, a pivotable trigger 16 movable relative to the stationary handle 14, an elongated central body portion 18 extending from the body 12, and an end effector 20 disposed on a distal end of the elongated central body portion 18. The end effector 20 of the stapling instrument 10 includes an anvil assembly 60 and a replaceable cartridge assembly 80.

A thumb button 12a is slidably positioned on each side of the body 12 of the stapling instrument 10. The thumb buttons 12a are movable to manually advance an alignment pin 86 (FIG. 4) slideably disposed within the replaceable cartridge assembly 80. A release button 12b is positioned on the proximal end of body 12 of the stapling instrument 10 and is depressible to allow the replaceable cartridge assembly 80 to return from an approximated position (not shown) disposed adjacent to the anvil assembly 60 (FIG. 1) to an open position spaced from the anvil assembly 60.

The stapling instrument 10 will be described to the extent necessary to fully disclose aspects of the present disclosure. For a detailed description of the internal structure and function of an exemplary surgical stapling instrument, please refer to commonly owned U.S. Pat. No. 6,817,508 (“the ’508 patent”), and commonly owned U.S. Pat. App. Pub. No. 2018/0153544 (“the ’544 publication”), the contents of which are incorporated by reference herein in their entireties.

With reference to FIGS. 2-6, the end effector 20 of the stapling instrument 10 (FIG. 1) includes a frame 50 having a base portion 52 and an L-shaped jaw portion 54 extending from the base portion 52. The L-shaped jaw portion 54 includes a longitudinal portion 54a and a transverse portion 54b. The anvil assembly 60 is supported on the transverse portion 54b of the jaw portion 54 of the frame assembly 50 and the cartridge assembly 80 is releasably supported within a head portion 32 of clamp slide members 30 within the base portion 52 of the frame assembly 50.

The base portion 52 and the transverse portion 54b of the jaw portion 54 of the frame assembly 50 of the end effector 20 are curved. In embodiments, the base portion 52 and the transverse portion 54b of the jaw portion 54 of the frame assembly 50 of the end effector 20 are substantially J-shaped although other curved and linear configurations are also envisioned. In embodiments, the end effector 20 includes a first radius of curvature and a second radius of curvature. The first and second radii of curvature may be increased or decreased to suit a particular procedure and/or to facilitate access to a particular body cavity or location within a body cavity. In some embodiments, the end effector 20 is formed by a plurality of substantially linear sections that are connected to each other to define a curved-like configuration. Each of the anvil assembly 60 and the cartridge assembly 80 include a curved configuration corresponding to the curved configuration of the frame assembly 50 of the end effector 20.

In embodiments, a pusher assembly 56 (FIG. 6) is operably disposed within the base portion 52 of the end effector 20. The pusher assembly 56 includes a pusher pin 56a, a pusher member 56b mounted on a distal portion of the pusher pin 56a, and a spring 56c received about the pusher pin 56a for biasing the pusher pin 56a distally. As described in the ’544 publication, the pusher pin 56a is maintained in

a retracted position by a lock member (not shown) of an interlock assembly (not shown). Loading of the replaceable cartridge assembly **80** within the frame assembly **50** of the end effector **20** depresses the lock member, thereby releasing the pusher pin **56a**. As described below, the pusher member **56b** on the pusher pin **56a** engages a tissue guide **84**, causing advancement of the tissue guide **84** into engagement with the anvil assembly **60**.

The head portions **32** (FIG. 2) of the clamp slide members **30** of stapling instrument **10** support the replaceable cartridge assembly **80** and are slidably supported within the base portion **52** of the frame assembly **50** of the end effector **20**. As disclosed in the '544 publication, the clamp slide members **30** advance in response to actuation of the trigger **16** (FIG. 1) of the stapling instrument **10** (FIG. 1) to cause advancement of the replaceable cartridge assembly **100** relative to the anvil assembly **60**. The head portions **32** of the clamp slide members **30** define a channel **31** configured to releasably support the replaceable cartridge assembly **80**. For a detailed description of the structure and operation of an exemplary end effector, please refer to the '544 publication.

The cartridge assembly **80** will only be described to the extent necessary to fully disclose the aspects of the present disclosure. For a detailed description of the structure and operation of an exemplary pusher assembly, please refer to the '544 publication.

The replaceable cartridge assembly **80** of the stapling instrument **10** includes a housing **82** having a base portion **82a** supporting the tissue guide **84** and an alignment pin retaining portion **82a** supporting an alignment pin **86** (FIG. 4). The base portion **82a** defines a plurality of staple receiving pockets **82a** that support a plurality of staples (not shown). As described above, when the replaceable cartridge assembly **80** is loaded within the frame **50** of the end effector **20**, the pusher assembly **56** is activated to cause a distal advancement of the tissue guide **84** (FIG. 6). As disclosed in the '544 publication, prior to or during actuation of the stapling instrument **10**, the alignment pin **86** (FIG. 4) is advanced into the anvil assembly **60** to capture tissue between the anvil assembly **60** and the replaceable cartridge assembly **80**. The tissue guide **84** and the alignment pin **86** operate together to facilitate and maintain alignment of the replaceable cartridge assembly **80** with the anvil assembly **60** during actuation of the stapling instrument **10**.

Although shown and described as including the pusher assembly **56** (FIG. 6), it is envisioned that the stapling instrument **10** may include alternative means for advancing the tissue guide **84**. For example, an alignment pin deployment member (not shown) configured for deploying the alignment pin **86**, as described in the '544 publication, may be modified to advance the tissue guide **84** simultaneously with the alignment pin **86**.

With particular reference to FIG. 3, the tissue guide **84** of the replaceable cartridge assembly **80** includes a proximal engagement portion **84a**, a distal head portion **84b**, and an elongate body portion **84c** extending between the proximal engagement portion **84a** and the distal head portion **84b**. A longitudinal groove **85a** extends the length of the tissue guide **84** for maintaining the rotational orientation of the tissue guide **84** relative to the replaceable cartridge assembly **80** during actuation of the stapling instrument **10**. A notch **85b** is disposed between the distal head portion **84b** and the elongate body portion **84c**. The notch **85b** accommodates an L-shaped protrusion **62** extending from the anvil assembly **60**. As described below, the L-shaped protrusion **62** releasably retains the tissue guide **84** in an extended position (FIG.

6). In embodiments, the distal head portion **84b** includes tapered first and second ends **87a**, **87b** to facilitate engagement and disengagement, respectively, of the distal head portion **84b** of the tissue guide **84** with the L-shaped protrusion **62** of the anvil assembly **60**. In some embodiments, and as shown, the L-shaped protrusion **62** may define a notch or cutout **63** to facilitate engagement of the distal head portion **84b** of the tissue guide **84** with the L-shaped protrusion **62**.

With reference to FIGS. 7 and 8, in an alternative embodiment of the present disclosure, a replaceable cartridge assembly **180** includes a tissue guide **184**. The replaceable cartridge assembly **180** is substantially similar to the replaceable cartridge assembly **80** described hereinabove, and therefore will only be described in detail as relates to the differences therebetween.

The tissue guide **184** of the replaceable cartridge assembly **180** extends distally from a base portion **182a** of a housing **182** of the replaceable cartridge assembly **180** is fixed to the base portion **182a**. The tissue guide **184** includes a tissue piercing tip **184a**. During operation of the stapling instrument **10** (FIG. 1), the tissue guide **184** is configured to pierce tissue (not shown) retained between the replaceable cartridge assembly **180** and the anvil assembly **60**. Engagement of the tissue guide **184** with the anvil assembly **160** during approximation of the replaceable cartridge assembly **180** and the anvil assembly **160** facilitates alignment of the replaceable cartridge assembly **180** with the anvil assembly **160**.

Referring now to FIGS. 9 and 10, in another embodiment of the present disclosure, a replaceable cartridge assembly **280** includes a tissue guide **284**. The replaceable cartridge assembly **280** is substantially similar to the replaceable cartridge assembly **180** described hereinabove, and therefore will only be described in detail as relates to the differences therebetween.

The tissue guide **284** of the replaceable cartridge assembly **280** includes a notch **285**. The notch **285** is configured to receive a portion of an L-shaped projection **262** extending from an anvil assembly **260** to releasably retain the tissue guide **284** in an extended position (FIG. 9). The tissue guide **284** is configured such that during initial loading of the replaceable cartridge assembly **280** within the frame **50** (FIG. 9) of the end effector **20**, the tissue guide **284** engages the L-shaped projection **262**. As the replaceable cartridge assembly **280** is moved to a fully loaded position within the frame **50** (FIG. 1), i.e., slid proximally towards the body **12** (FIG. 1) of the stapling instrument **10**, the tissue guide **284** extends from the body portion **282a** of the replaceable cartridge assembly **280** to maintain engagement with the L-shaped projection **262** of the anvil assembly **260**.

With reference now to FIGS. 11-15, in another embodiment of the present disclosure, an end effector **320** (FIG. 12) includes a replaceable cartridge assembly **380** having a tissue guide member **384**. The end effector **320** and the replaceable cartridge assembly **380** are substantially similar to the end effector and the replaceable cartridge assemblies described hereinabove, and will only be described in detail as relates to the differences therebetween.

The tissue guide member **384** of the replaceable cartridge assembly **380** includes a tissue guide portion **384a** and a base portion **384b**. The tissue guide portion **384a** extends parallel to the base portion **384b** and may be integrally formed, as shown, or may be formed separately and secured together in any suitable manner. The tissue guide member **384** is slidable secured to a base portion **382a** of the replaceable cartridge assembly **380**. The base portion **384b**

of the tissue guide member 384 defines a pair of opposed cutouts 385 (FIG. 13) configured to receive a pair of opposed tabs 355 formed on a transverse portion 354b of a jaw portion 354 of a frame assembly 350 of the end effector 320.

With particular reference to FIG. 13, when the replaceable cartridge assembly 380 is partially loaded into the frame assembly 350 of the end effector 320, the opposed tabs 355 on the transverse portion of the jaw portion 354 of the end effector 320 are received within the opposed cutouts 385 in the base portion 384b of the tissue guide member 384.

As the replaceable cartridge assembly 380 is slid into the fully loaded position (FIG. 14), in the direction indicated by arrow "B" shown in FIG. 14, the tissue guide member 384 of the replaceable cartridge assembly 380 remains fixed relative to the transverse portion 354b of a jaw portion 354 of a frame assembly 350 of the end effector 320.

With particular reference to FIG. 15, during approximation of the replaceable cartridge assembly 380 relative to an anvil assembly 360 in the direction indicated by arrow "C" as the stapling instrument 10 is actuated, the tissue guide member 384 facilitates and maintains alignment of the replaceable cartridge assembly 380 relative to the anvil assembly 360.

With reference to FIGS. 16 and 17, in an alternative embodiment, a tissue guide assembly 484 includes a tissue guide member 484a that is separate or movable from a base 484b. A spring 484c received about a proximal portion of the tissue guide member 484a facilitates advancement of the tissue guide member 484a into engagement with an anvil assembly 460. More particularly, the tissue guide member 484a includes proximal and distal flanges 485a, 485b (FIG. 17). The spring 484c is disposed about the tissue guide 484a between the proximal and distal flanges 485a, 485b. The tissue guide member 484a is retained in a retracted position (not shown) by the base portion 482a of the replaceable cartridge assembly 480. When the replaceable cartridge assembly 480 is advanced during approximation of the replaceable cartridge assembly 480 relative to the anvil assembly 460, the spring 484c biases the tissue guide member 484a distally into engagement with the anvil assembly 460.

With reference now to FIGS. 18-21, in another embodiment of the present disclosure, a replaceable cartridge assembly 580 includes a tissue guide assembly 584. The tissue guide assembly 584 includes first and second telescoping members 586, 588. The first telescoping member 586 includes a proximal portion 586a that engages a body portion 582a of the replaceable cartridge assembly 580 and the second telescoping member 588 includes a distal portion 588a that engages an anvil assembly 560. The second telescoping member 588 defines a channel 587 (FIG. 19) through which the proximal portion 586a of the first telescoping member 586 is slidably disposed such that the first and second telescoping members 586, 588 can slide relative to one another during approximation and retraction of the replaceable cartridge assembly 580 relative to the anvil assembly 560. The tissue guide assembly 584 facilitates and maintains alignment of the replaceable cartridge assembly 580 relative to the anvil assembly 560 during operation of the stapling instrument 10 (FIG. 1).

With reference to FIGS. 22-25, in yet another embodiment of the present disclosure, a replaceable cartridge assembly 680 includes a tissue guide member 684. The tissue guide member 684 is pivotally secured to a body portion 682a of the replaceable cartridge assembly 680 by a pivot member 684a (FIG. 25) and is moveable between a

vertical position (FIG. 22) and a horizontal position (FIG. 23). The tissue guide member 684 is maintained in the vertical position during shipping and loading of the replaceable cartridge assembly 680 by a shipping cap (not shown).

Upon loading of the replaceable cartridge assembly 680 within a frame assembly 650 of an end effector 620, and removal of the shipping cap, the tissue guide member 684 pivots from the vertical position to the horizontal position. In embodiments, the tissue guide member 684 is spring biased.

With particular reference to FIGS. 24 and 25, the pivot member 684a of the tissue guide member 684 is slidably received within a channel 683 in the body portion 682a of the replaceable cartridge assembly 680 and is releasably maintained in an advanced position by a bump 683a on the body portion 682a that extends into the channel 683. During approximation of the replaceable cartridge assembly 680 relative to an anvil assembly 660, the force of the pivot member 684a of the tissue guide member 684 against the bump 683a pushes the pivot member 684a over the bump 683a, thereby permitting the body portion 682a of the replaceable cartridge assembly 680 to advance over the tissue guide member 684 as the replaceable cartridge assembly is advanced to an approximated position (not shown).

Referring to FIGS. 26-28, in another embodiment of the present disclosure, an end effector 720 includes a replaceable cartridge assembly 780 having a tissue guide member 784. A distal portion 784a of the tissue guide member 784 includes a snap feature 785 for securing the tissue guide member 784 to an anvil assembly 760. During initial loading of the replaceable cartridge assembly 780 into a frame assembly 750 of the end effector 720, the snap feature 785 engages the anvil assembly 760 of the end effector 720. The tissue guide member 784 remains in an extended condition as the replaceable cartridge assembly 780 is slid proximally within the base portion 752 of the frame assembly 750 to its fully-loaded position, and during approximation and actuation of the end effector 720.

With reference to FIG. 29-32, in another yet another embodiment of the present disclosure, an end effector 820 (FIG. 30) includes a pusher assembly 856 for advancing a tissue guide member 884. The pusher assembly 856 includes a pusher pin 856a extending from a pusher base 856b, a pusher member 856c slidably mounted on about the pusher pin 856a, and a biasing member 856d (FIG. 29) received about the pusher pin 856a between the pusher member 856c and the pusher base 856b. The pusher base 856b secures the pusher assembly 856 within the base portion 852 of the frame assembly 850. The pusher member 856c is configured to engage the tissue guide member 884 of the replaceable cartridge assembly 880. The biasing member 856d is configured to bias the pusher member 856c distally.

With reference to FIG. 30, during initial loading of the replaceable cartridge assembly 880 within a frame assembly 850 of the end effector 820, a shipping cap (not shown) retains the tissue guide 884 within a body portion 882a of the replaceable cartridge assembly 880. A proximal end of the tissue guide 884 engages the pusher member 856c of the pusher assembly 856.

Turning to FIG. 31, as the replaceable cartridge assembly 880 is slid to the fully-loaded position, the tissue guide member 884 pushes the pusher member 856c proximally, thereby compressing the biasing member 856d.

As shown in FIG. 32, after the shipping cap (not shown) is removed from the replaceable cartridge assembly 880, the tissue guide member 884 is advanced by the pusher member

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856c, which is acted upon by the biasing member 856d, into engagement with the anvil assembly 860.

Referring now to FIGS. 33-35, in still yet another embodiment of the present disclosure, an end effector 920 includes a replaceable cartridge assembly 980 having a tissue guide assembly 984. The tissue guide assembly 984 includes a tissue guide member 984a and a bushing 984b disposed on a proximal end of the tissue guide 984a. During initial or partial loading of the replaceable cartridge assembly 980 within a frame assembly 950 of the end effector 920, the tissue guide member 984a is retained within the body portion 982a of the replaceable cartridge assembly 980. As the replaceable cartridge assembly 980 is slid into a fully-loaded position, the bushing 984b on the proximal end of the tissue guide 984a engages a thrust bar 934 in the end effector 920, causing the tissue guide 984a to advance from within the body portion 982a of the replaceable cartridge assembly 980.

As illustrated in FIG. 35, during approximation and actuation of the replaceable cartridge assembly 980, the bushing 984b slides along the tissue guide member 984a, as indicated by arrow "D".

With reference to FIGS. 36-38, in yet another embodiment of the present disclosure, a replaceable cartridge assembly 1080 includes a tissue guide member 1084 having a bent distal portion 1084a. During initial loading of the replaceable cartridge assembly 1080 within a frame assembly 1050 of the end effector 1020, the bent distal portion 1084a of the tissue guide member 1084 is received within an opening 1061 in a flange 1062 of the anvil assembly 1060. Alternatively, and/or in addition, the opening may be in the frame assembly 1050 of the end effector 1020. As the replaceable cartridge assembly 1080 is slid into the fully-loaded position, the tissue guide member 1084 is advanced from a body portion 1082a of the replaceable cartridge assembly 1080.

It will be understood that various modifications may be made to the embodiments disclosed herein. For example, the components of the surgical stapling instrument can be formed of any material suitable for surgical use and having the required strength characteristics. Therefore, the above description should not be construed as limiting, but merely as exemplifications of embodiments. Those skilled in the art will envision other modifications within the scope and spirit of the claims appended hereto.

The invention claimed is:

1. A surgical stapling instrument comprising:

an elongate body portion defining a longitudinal axis and having a proximal portion and a distal portion; and

an end effector supported on the distal portion of the elongated body portion, the end effector including:

a frame having a base portion and a jaw portion, the base portion being secured to the distal portion of the elongate body portion;

an anvil assembly supported on the jaw portion, the anvil assembly including an L-shaped protrusion fixedly mounted on an exterior surface of the anvil assembly and that extends proximally from the jaw portion towards the base portion of the frame of the end effector;

a cartridge assembly releasably supported on the base portion, the cartridge assembly including a housing and a tissue guide, the tissue guide moveable from a retracted position to an advanced position relative to the housing of the cartridge assembly; and

a pusher assembly disposed within the base portion of the frame of the end effector, the pusher assembly

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being configured to move the tissue guide from the retracted position to the advanced position such that the tissue guide engages the L-shaped protrusion of the anvil assembly to releasably retain the tissue guide in the advanced position.

2. The surgical stapling instrument of claim 1, wherein the tissue guide includes a tapered distal end surface.

3. The surgical stapling instrument of claim 1, wherein the tissue guide includes a notch that receives a portion of the L-shaped protrusion of the anvil assembly.

4. The surgical stapling instrument of claim 1, wherein the cartridge assembly further includes an alignment pin disposed within the housing of the cartridge assembly and moveable from a retracted position to an advanced position relative to the housing.

5. The surgical stapling instrument of claim 1, wherein the housing of the cartridge assembly defines a plurality of staple receiving pockets.

6. The surgical stapling instrument of claim 1, wherein the tissue guide includes a feature for maintaining a rotational orientation of the tissue guide relative to the housing of the cartridge assembly.

7. The surgical stapling instrument of claim 1, wherein the tissue guide has a length and defines a longitudinal groove extending along the length of the tissue guide.

8. An end effector for a surgical stapling instrument, the end effector comprising:

a frame having a base portion and a jaw portion, the base portion configured to be secured to an elongate body portion of the surgical stapling instrument;

an anvil assembly supported on the jaw portion, the anvil assembly including an L-shaped protrusion fixedly mounted on an exterior surface of the anvil assembly and that extends proximally from the jaw portion towards the base portion of the frame of the end effector;

a cartridge assembly releasably supported on the base portion, the cartridge assembly including a housing and a tissue guide, the tissue guide moveable from a retracted position to an advanced position relative to the housing of the cartridge assembly such that the tissue guide engages the L-shaped protrusion of the anvil assembly to releasably retain the tissue guide in the advanced position; and

a pusher assembly disposed within the base portion, the pusher assembly being configured to move the tissue guide from the retracted position to the advanced position such that the tissue guide engages the anvil assembly.

9. The end effector of claim 8, wherein the tissue guide includes a tapered distal end surface.

10. The end effector of claim 8, wherein the L-shaped protrusion of the anvil assembly defines a notch that receives the tissue guide.

11. The end effector of claim 8, wherein the cartridge assembly further includes an alignment pin disposed within the housing of the cartridge assembly and moveable from a retracted position to an advanced position relative to the housing of the cartridge assembly.

12. The end effector of claim 8, wherein the housing of the cartridge assembly defines a plurality of staple receiving pockets.

13. The end effector of claim 8, wherein the tissue guide includes a feature for maintaining a rotational orientation of the tissue guide relative to the housing of the cartridge assembly.

14. The end effector of claim 8, wherein the tissue guide has a length and defines a longitudinal groove extending along the length of the tissue guide.

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